

# COMPUTERWORLD

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## GE Sets Data Throughput Fee for T/S Users

By Drake Lundell

CW New York Bureau

BETHESDA, Md. — GE's time-sharing arm, the information service department, has extensively restructured its time-sharing prices, which could increase monthly time-sharing costs for many users.

The charges, effective in May, include a reduction in the hourly terminal-connect rate and a new data throughput charge based on a character input/output (I/O) measurement concept for users of the GE Mark II time-sharing

system.

As part of the extensive restructuring move, GE said it will institute a minimum monthly charge of \$100 on both the Mark I and Mark II services.

In addition, a new low-cost data base storage capability will be available.

The data throughput concept, believed to be the first in the industry, will increase large users' costs. In combination with the other charges, a decrease in cost for many small users could result, GE said. The average user

should not be affected in total monthly costs, according to GE sources.

### New Charges Outlined

The revised connect time rate is \$6/hr compared with the previous rate of \$11/hr. I/O will be charged at a rate of 40 cents per 1,000 characters.

Under the new rate structure, a user with a teletypewriter installation operating at 10 char/sec would effectively pay more money to transmit or receive the same amount of data. At 10

char/sec the user can transmit 36,000 char/hr using batched transmission of data prepared on paper tape.

With the new pricing the user would pay \$14.40 I/O charge for the data transmitted, plus the reduced connect-time charge of \$6. The total cost to transmit the data using a relatively slow teletypewriter would then be \$20.40 as opposed to the existing flat hourly rate of \$11.

Users with the capability to transmit data at higher speeds would also pay higher rates with the new pricing.

However, GE sources told CW that the average user transmits at a rate of 10,000 char/hr. This rate would reduce the I/O charge proportionately.

GE said the introduction of I/O character counting was necessary because the Mark II system is presently handling a large number of different speed terminals. I/O character counting, GE said, is the most equitable method to charge customers for the different capabilities.

### DSU Option

The other major change is the introduction of a new data storage unit (DSU) option, which GE said will enable customers to take advantage of low-cost bi-

nary file storage capability for data base applications.

Charged at the rate of 50 cents per DSU, the new rate is less than half the rate for regular Ascii program storage units. Regular program storage now costs \$1.10 per 1,280 char/mo, an increase of 10 cents per unit.

According to Paul R. Leadley, general manager of the information service department, the reduced \$6/hr terminal connect rate will enable users developing programs and those having applications with little I/O requirements to realize lower service charges. Costs for customers producing large amounts of I/O will be somewhat higher, but will be somewhat offset by the lower DSU rate, he said.

### Mark I Costs Also Changed

At the same time, GE announced a new schedule of charges for Mark I time-sharing service. The key innovation, according to GE, is the availability of a dedicated access option under the new rates.

The new dedicated access option will allow Mark I users to minimize delays in connecting with the system and to stabilize monthly charges over a 12-month period, GE claimed. (Continued to Page 2)

## I/O Speed, Multiprogramming Featured with Burroughs 4504

Donald M. Leavitt

CW Staff Writer

DETROIT — Users dealing principally with business applications in environments where on-line, real-time, multiprogramming, and data communications operations are "normal methods of day-to-day processing" can utilize a new computer from the Burroughs Corp.

The B4504, the first model in the B4500 Series, compares in price and performance between the earlier B3500 and B5500/B6500 computers.

The system can provide disk, tape, and terminal capabilities, utilizing the peripheral devices developed for the B3500. But the B4504 has far greater core capacity and faster speeds than the earlier machine, the company said.

Intended to give B3500 users upward mobility, the B4504 is said to be "program-compatible." Any program written for the B3500 master control program, language compilers, utility routines and user-written appli-

cation programs can be run on the B4504 without recompilation, according to a company spokesman.

Burroughs expects Cobol to be the primary language for the B4504, but Assembler, Basic, and Fortran IV software will also be available for initial delivery.

### Up to 500K Memory

The new system includes a core memory expandable in 50K-byte increments from 100K to 500K. The B4504 main memory operates at 500 nsec/cycle, with a memory word of two 8-bit bytes accessed in each cycle. This gives an effective speed of 250 nsec for each byte accessed.

Included in a basic B4504 system are eight input/output (I/O) channels which can be expanded to a total of 20. Each channel has its own control for accessing main memory, and all 20 can operate concurrently.

Address memory is said to operate at 50 nsec, which is twice as fast as the B3500. The B4504

utilizes an ultra high-speed "scratchpad" memory which combines with the I/O peripheral controls to allow each I/O channel to function separately.

### Hundreds of Remote Locations

In addition to the I/O channels, the B4504 will handle single-line and multi-line data communications controllers that can service up to 36 separate lines. With these lines, the com-

(Continued to Page 4)

## Report Hits Mass. DP Misuse: Mismanagement Costs Millions

By Edward J. Bride

CW Staff Writer

BOSTON — Misuse and underuse have created a data processing wasteland in Massachusetts, according to a report filed last week by Commissioner of Administration Donald R. Dwight. Besides charging the state with

employing data processing personnel with a "low level of competence," the report also charges that the state has "mistakenly attempted" to increase its total data processing capability by "merely upgrading its computer inventory without regard for efficient system designs to utilize equipment in a cost-effective manner."

The report charges state agencies with not researching data processing requests and not optimizing equipment. It says many computers are idle for two-thirds of the time.

As a result, said Dwight, the state wastes millions of dollars a year in salaries, purchases, and equipment rental.

So Dwight has proposed legislation to staff a permanent office to coordinate purchases and oversee computer usage.

State legislators have charged "mismanagement" of computer installations, and they plan to conduct public hearings on purchase procedures this month.

The report, titled "Data Processing in the Commonwealth of Massachusetts — A Summary Report," says that Massachusetts had "ordered, installed, and mis-

utilized" millions of dollars of data processing equipment.

It also alleges:

- "Shoddy design" and "slipshod implementation" may require the state to rebuild two data processing systems "from scratch."

- One state agency spends \$200,000 annually on personnel training with "no discernible improvement in the quality of its EDP operation."

- Two "technically rather simple" systems have been over a year in the design stage. They

(Continued to Page 2)

## Keyplex Pools 64 Stations Input

By Frank Piasta

CW Staff Writer

SAN DIEGO, Calif. — Honeywell has provided users of input preparation equipment with a new device, the Keyplex system, which can feed information from 64 keyboard entry stations to a magnetic tape, simultaneously, according to Honeywell.

The system consists of the keystations, processor, disk storage device, and magnetic tape drive. Software support is also provided. Data is transferred from keystation to disk, and then batch-loaded onto tape, under control of a supervisor station.

The system, according to Honeywell, is designed to replace medium and large keypunch installations and can accommodate a wide variety of data-preparation applications for computer users.

Similar in concept to several competitive systems, the Keyplex system falls about midway between the Inforex key entry system, which can service up to eight stations, and the Logic LC-720,

with a capacity of 120 keyboard terminals.

### Sent by Multiplexer

The system allows the operator to punch data, using a keyboard similar to that of the Honeywell Keytape unit, and which is sent via a multiplexer to the processor. The keystation is equipped with a one-character display, and a three-digit position counter, as well as an indicator showing the keypunch program being used.

The character display is used in punching, to show the last character entered, and in verification, to display the character to be verified.

The position counter indicates the location of the character being processed in the record. Maximum record length is 400 characters, a limitation imposed on the system by the magnetic tape drive that is used, Honeywell said.

The program indicator has provisions for four programs, similar to a keypunch drum-card in concept. Honeywell, however, said that up to 400

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# Millions Lost to 'Slipshod' Mass. Procedures

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should have required the efforts of two qualified programmer/analysts each for six months each, but so far have cost over a million dollars "and will require an additional \$400,000 to complete."

Compiled in his Bureau of Systems Analysis, the report is the chief reason behind Dwight's filing of legislation to make permanent, and provide additional staffing for the bureau.

The report was actually prepared by Alvin Kaltman, direc-

tor of the Bureau of Systems Analysis, Data Processing, and Telecommunications.

Hired last summer to untangle the state's data processing problems, Kaltman's first assignment was this definitive report on the sources of the trouble.

Kaltman was critical of the "low level of competence in state data processing installations," and said the new, permanent Bureau of Information Systems (BIS) should be outside the civil service environment.

He claimed the impetus of competition was lacking in government employment within civil service. "All they're interested in is tenure."

He added that the security of civil service has no appeal for qualified computer professionals. "They see no potential for growth in the system's measured increments."

Kaltman said the BIS, in its first year of operation, could realize "direct savings over estimated fiscal 1971 EDP costs" of almost \$3 million.

Admitting that "cost avoidance figures are at best unreliable," Kaltman guessed that the design of new systems for "just two agencies could result in annual savings of \$3,325,000."

He said that, if data processing expenditures continue to increase at their present rate, the Massachusetts data processing budget will grow from over \$11 million last year to \$40.5 million in fiscal 1973.

In releasing the report, Dwight said he had "no indication" of improprieties in purchasing equipment, but "the potential is there," and the proposed permanent BIS would "eliminate that potential."

## Overlapping Systems

The report cites requests for overlapping systems, lack of cooperation despite compatible systems, lack of coordination and absence of competitive bidding in requests for vendors' proposals.

## Proposed Duties Of Mass. Bureau

The proposed Bureau of Information Systems in Massachusetts would be charged with the following tasks:

- Operate data-processing installations to service present and potential computer applications.
- Phase out existing agency installations when economics and efficiencies of operation can be accomplished by so doing.
- Assign workloads to agency equipment and personnel.
- Centralize systems and programming staff to service all agencies.
- Develop priorities for future EDP applications.
- Develop long-range plans for management information systems.
- Have responsibility for equipment selection.
- Have responsibility for retaining computer consultants.

Commenting on charges of mismanagement, Kaltman said he thought that state installations were "mismanaged to the point of being non-managed."

Four years ago, Lockheed Missiles and Space Co. conducted a review of EDP activities in Massachusetts, and reported that data processing installations had been developed to meet very specific needs. As such, the report said that any progress had been accomplished in an uncoordinated, autonomous fashion that was both costly and inefficient.

Lockheed recommended that EDP Service Centers be established, and the new report by the administration echoes that thought.

The report states specifically that there should be an incentive for an "autonomous center to integrate its data systems with the remainder of the state."

Kaltman said that the establish-

ment of a state center, with the concurrent elimination of many of the state's 34 computers, would reduce the repetition of administrative procedures in different installations.

Not wishing to name specific agencies, Kaltman noted that the present "autonomous" state centers often use mass-storage random-access devices as "expensive typewriters."

Other benefits of his BIS would be bulk-buying of supplies, with possible savings of up to 50% for some items; creation of documentation standards ("most of the major software systems... are not supported by any useful documentation"); and elimination of the trite but common "re-inventing of the wheel."

## Could Have Done Worse?

Admitting that the "picture presented here is an ugly one," the report says that "it is amazing that the Commonwealth has not done worse."

Some more specific problems and remedies are discussed:

• There was little or no information systems planning at the departmental level — and what little there was, was not documented.

• One agency submitted a "five-year planning report," with a request for a new computer that was not included in the report.

• "Since planning is virtually nonexistent, procurement procedures cannot help but be bad." Procurement of hardware is theoretically competitive; the procurement of services is very rarely so.

• The data preparation system at one agency will cost \$750,000 annually in equipment rental and additional personnel salary costs. The system could be redesigned to operate for under \$100,000 annually.

• State installations rent disk packs; some have more than 25 on hand when, in fact, the proper use of disk-to-tape utility routines would often reduce the number of disk packs needed to no more than four, and these could be purchased at a considerable savings.

• The ratio of keypunches to verifiers at a data preparation center is normally about 3 to 1; in Massachusetts it is generally about 1.5 to 1.

Monitoring money matters

may help, but planning must precede implementation, Kaltman asserted. He admitted that the problems which drive agencies to generate requests for new and larger EDP facilities are real.

And, he said, the level of personnel competence is very often a major problem, but denying funds and ignoring equipment acquisition problems do "not make those problems disappear."

"It only aggravates an already bad situation until... the request can no longer be denied. By this time, the situation is so critical that the project is behind schedule even before it started."

Kaltman concluded that "expediency demands slipshod design, slovenly implementation,

## Centralization Survey

After the release of the Massachusetts report, CW surveyed over half of the states, emphasizing high population areas. Of the states surveyed, five claimed to have a centralized DP system in operation. Twelve said they have had such an operation in the planning, or early stages, and 13 had no intention of establishing such an installation.

Only one DP advisory committee claimed to have judicial power in its recommendations, and the majority of the other DP committees consisted of one man. Few of these committees were created through legislative acts and even fewer were granted any funds with which to work.

and no documentation... Instead of a working tool, the agency has a piecemeal, patched-up mess that never works right."

Kaltman said the benefits of a centralized state EDP office would be threefold:

• Cost savings by eliminating certain existing computer and unit record installations.

• Avoidance of heavy start-up costs. Through use of an EDP service center, an agency could start EDP activities by using the center facilities instead of developing in-house resources.

• Improved system development.

## GE Sets Data Throughput Fee for Time-Share Users

(Continued from Page 1)

With the option, users are provided private telephone number access to a GE-265 system. Monthly charges for dedicated access service are based on the area served and start at \$1,200/mo.

The price provides the user with an unlimited amount of terminal-connect time, 10,000 computer resource units, and 200 program storage units per month. Additional resource and program storage units are billed monthly at standard rates.

The increases for regular Mark I service are the first announced since the system was introduced in 1965.

Under the new rates, terminal-connect time will be raised from \$7.50/hr to \$8.50/hr. Computer resource units will go up one cent to five cents per unit, while program storage will stay unchanged at \$1.75 per 1,536 char/mo.

Additional Mark I charges include the introduction of a stored object code capability which eliminates the need to recompile stored programs each time they are run. Also, a deferred run option will permit users to enter a program and call for results the next morning, saving terminal-connect charges normally associated with the processing.

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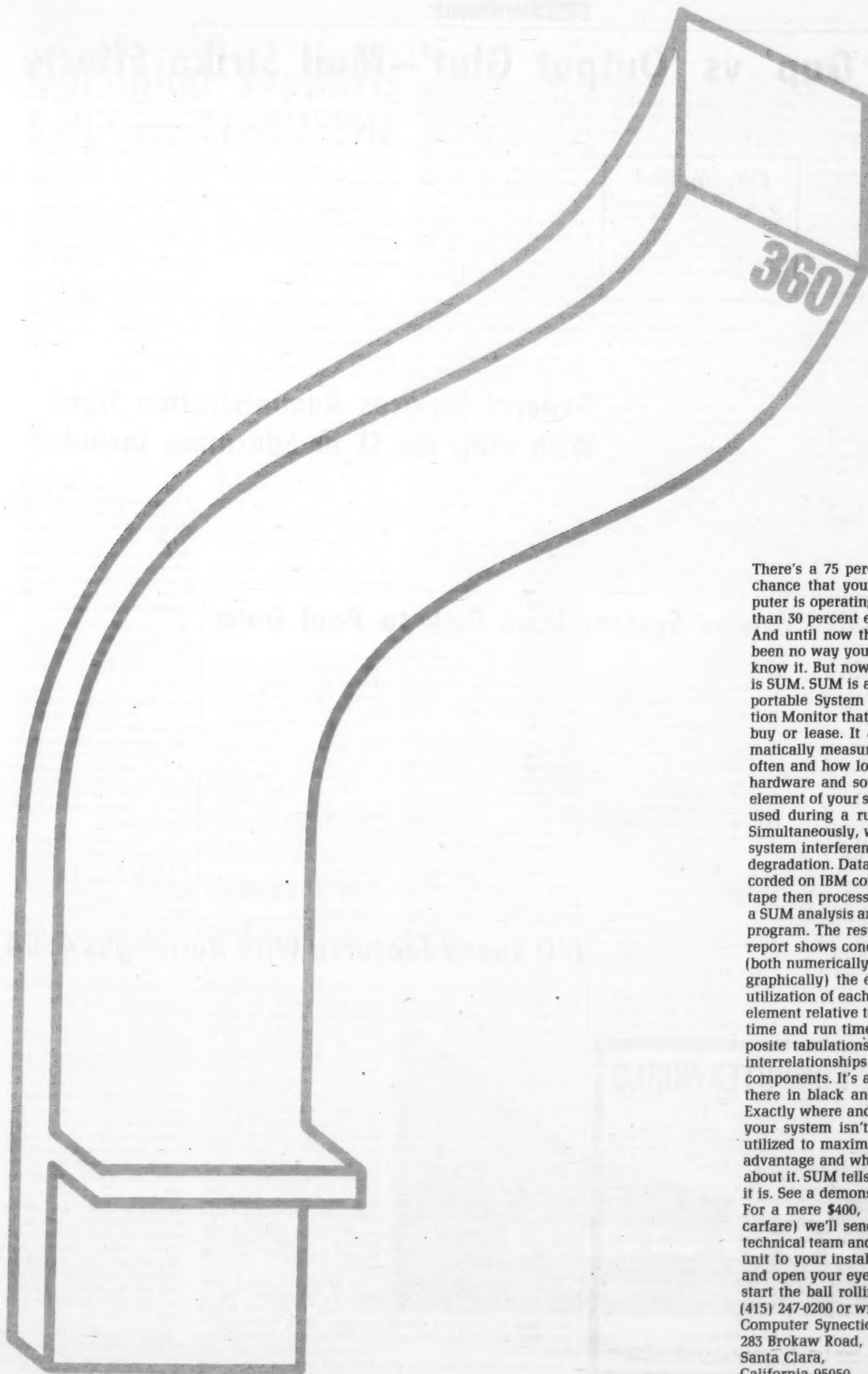
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# 'Input Gap' vs 'Output Glut'—Mail Strike Effects

By Drake Lundell  
CW New York Bureau

NEW YORK — The specter of millions of dollars worth of equipment standing idle because of lack of data to be processed stalked the computer rooms here last week before President Nixon ordered federal troops to "move the mail" in the place of striking letter carriers.

The crisis was averted when the President sent federal troops into New York City and when striking mailmen returned to their jobs last Thursday.

Input gap was becoming apparent among some of the large computer centers in New York when the strike reached its sixth day and was compounded by a different problem — output glut.

The problem was most acute at the large credit card billing centers, the computer operations of such firms as American Express, Diner's Club, and Carte Blanche; but it also affected such firms as New York Telephone and Consolidated Edison.

These firms all depend on fairly sophisticated billing systems to match customer payments with past bills and to process charges and prepare new bills for subscribers.

They usually have entire data

processing operations dedicated to these services that cannot be transferred to other in-house functions.

## CWs Mailed

Issues of *Computerworld*, March 25, that had been under postal zone embargo (New York City, Connecticut, and Pennsylvania) were mailed from the CW Chicago printing plant on March 26.

It is clear that none of the firms had any contingency plans for the unexpected mail strike.

### Input Lags for Systems

The large credit card companies were hit particularly hard by the input gap. Normally they process thousands of documents a day, matching charges with customer accounts and then preparing the bills. This could run as high as 50,000 different accounts a day, with each account having several charges to it.

Most of the firms were unwilling to put a dollar figure on their under-utilization of equipment in the early days of the strike, but they all admitted that the equipment was being used at

below normal levels.

A spokesman for Diner's Club said Monday: "By late this week, we won't have anything left to process if the strike isn't cleared up. After that, we might as well shut down the computer center and give everyone a vacation."

An American Express spokesman admitted that "it has affected our operation quite a bit. We are beginning to run out of material, and could be out by the end of the week."

The input problems at Consolidated Edison and the telephone company followed a different pattern, since they do not depend on the mail to find out which accounts are using the

services.

Consolidated Edison said it was "horribly" affected because it could not match payments with past-due accounts. As a result, it did not cut off service to any subscribers until after the strike.

Consolidated did not receive approximately \$3 million per day in payments and New York Telephone did not get approximately \$7 million per day that normally comes in.

### Output Mounts

In addition to the input gap, all of the firms experienced an output storage problem. The computer rooms were still producing bills even while the strike was on — in some cases over

100,000 per day — but there was no place to put them.

During the strike stacks of bulging mailbags, full of computer-prepared bills, clogged hallways and corridors between computer centers and mailrooms at most of the large firms here.

Many of the companies reported that they were running out of mailbags, and couldn't predict what they would have done with the bills if the supply had run out.

The firms also reported to be short on postage, and some felt that they would have had to close down their computer billing centers if the problems of the mailrooms had become critical.

## General Services Administration Signs With IBM; No SE or Education Included

WASHINGTON, D.C. — Two services included in last year's General Services Administration (GSA) contract with IBM Corp. are not being carried over this year. Systems Engineering and DP Education are being offered on a charge basis for the first time.

The new contract calls for an expected \$330 million of business for the company in the fiscal year begun last July 1, reportedly the largest schedule contract ever for ADP products, according to a GSA official.

The extra charge, recently agreed upon, will be retroactive

to Jan. 1, 1970.

Similar to previous pacts with IBM, the agreement does not mention a dollar figure. The value placed on it reflects agency officials' estimates of purchases, rentals, and maintenance of ADP equipment and related software involving an indefinite quantity of IBM products expected to be required by federal agencies.

The total revenue produced by the new contract would represent a substantial increase from the previous fiscal year high of \$293 million.

The Federal Supply Schedule contract involves the complete lines of IBM hardware and software excepting approximately 20 new program product packages, for possible leasing, which are being unbundled at extra charge. Each agency will now have a separate contract for these packages.

The GSA, which reviews all government contracts, feels the new pact will allow leasing to be more efficient and data processing to be coordinated with all agencies and departments.

## Honeywell Keyplex System Uses Disk to Pool Data

(Continued from Page 1)

such programs can be accommodated in one Keyplex system, and all are available to any operator. The program for a record can include as many as 400 control characters and is said by Honeywell to be a major advantage over its competitors. Similar systems restrict the number of control characters to two char/record.

### Buffer Interim Storage

Data, having passed through the on-site multiplexer to the processor, is there identified with its keyboard source, checked for validity, and placed in a buffer reserved in memory for the output of that station.

The processor, a Honeywell-built mini 16K 16-bit machine, is used also for data preparation and editing. Check digit generation and validation can be performed, and batch-totals taken, during x data entry.

Data is written out on a Honeywell-built, 3.5-million character disk drive at the address assigned to the output of a keystation for a particular job. The data is stored on the disk until it is transferred onto tape, under command of the supervisor station. Each disk area is said to be large enough to contain an operator's daily production.

Data transfer from disk to tape can occur at any time, including before a job is completely entered.

### Verification

Verification can occur at any time after the data is initially keyed in until it is written out onto tape. Verification can be performed by the originating station, or it can be done at any other station on the system.

The transfer of data from disk to tape can be done without interrupting the keyed data en-

try operation. The use of the buffer area to store data before it is written to disk makes the transfer operation seem simultaneous with punching, Honeywell said.

The Keyplex system can record data on 7-track, 556 bit/in. BCD tapes as well as 9-track, 800 bit/in. Ebcidic tapes. Both are said by Honeywell to be compatible with tape drives made by manufacturers, such as IBM, RCA, and Univac.

The supervisor station, a modified Teletype Model 33 ASR, is used primarily as a monitoring device. It is used to set up jobs and to control information flow, including the transfer of data

from disk to tape.

The Keyplex system can use many of the accessory devices currently available with Keytape units. These include: line printer, serial printer, communicator, and others.

The price of a 25-keystation system has been given as an approximate range from \$2,800 to \$3,800 depending on length of lease, with a \$150,000 purchase price. More exact pricing has not been released, but Honeywell said prices will be competitive with other systems of this type.

Honeywell said that deliveries of the Keyplex system will begin in January, 1971.

## I/O Speed Featured With Burroughs 4504

(Continued from Page 1)

pany said, the system can handle "hundreds" of remote locations through on-line networks.

An exact number of terminals is not available since the number on a line will vary based on the type of equipment used.

For on-line operations, the company spokesman noted that the Burroughs TC500 and TC700 terminals can be used locally as computers to check data before it is transmitted to the B4504.

This pre-editing and a burst-mode method of transmission used by the I/O channels make the system highly efficient, the company said.

### IBM 360 Comparison

The Burroughs B4504 appears to be similar in capability to the IBM 360/50, although it has a main memory cycle time that is only half that of the IBM machine.

Execution time for instructions on the B4504 has not been

given, but the company said it is twice as fast as the Burroughs B3500. On that basis, the B4504 would seem to have a slight edge on the 360/50. To add a two-place figure to a three-place figure, for example, takes 16.5 usec on the B4504 as opposed to 18.8 usec on the Model 50.

Channel structure appears to differ markedly between the two machines. The 360/50 has a maximum of three selector channels and one multiplexer channel, which can be split into 64, 128, or 256 subchannels. Maximum data rate on the selector channel is 800K byte/sec, while the multiplexer operates at 40K byte/sec. In burst mode this figure can jump to 200K byte/sec.

The B4504 can have a maximum of 20 channels, and of these only 10 may be type B channels, which correspond to the IBM selector channels in that they are intended for high-speed devices. A Burroughs spokesman claimed a data transfer rate of

two million byte/sec while still guaranteeing every other cycle for computing.

Although both the 360/50 and the B4504 can utilize conventional one-tape-per-unit tape drives, the B4504 can also use the 'tape cluster' developed for the B3500. With this hardware choice, the user can mount either one, two, or three tapes within a single unit. Although these are under separate I/O control, they make use of the same basic system within the unit.

Purchase prices for B4504 systems range from around \$1 million to \$2.5 million, with leased systems ranging from \$16,000/mo to \$55,000/mo. Burroughs said that contracts will include software and support services in addition to hardware.

Initial deliveries are expected to begin in the fourth quarter of 1971, according to the company.



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## 'Solid Legislation'

# Gallagher Supports Sullivan Credit Bill

By a CW Staff Writer

WASHINGTON, D.C. — "A great public utility, dealing solely in data on individual, identifiable Americans, is looming on the horizon," declared Rep. Cornelius E. Gallagher (D-N.J.). "The credit industry is clearly moving toward an almost total computerization."

Gallagher, who held some of the first hearings on credit bureaus, was testifying for the Sullivan Fair Credit Reporting Bill [CW, Mar. 25].

The Sullivan bill marks the beginning of a national policy that comes "down hard on the side of personal privacy in the age of the computer," Gallagher said. "At long last, the concept of privacy is to be cloaked in solid and effective legislation."

The House Subcommittee on Consumer Affairs will be holding hearings on the Sullivan bill through April 8. The bill introduced into the House of Representatives by Rep. Leonor Sullivan (D-Mo.) is far stronger than the Proxmire Fair Credit Reporting Bill passed unanimously by the Senate last year. The credit bureaus have begun a letter-writing campaign in support of the Proxmire bill and against the Sullivan bill.

### Proxmire Bill 'Mere Illusion'

The Proxmire bill is "mere illusion cloaked in high-sounding titles and preambles," while the Sullivan bill "offers the public substance," according to Arthur Miller, professor of law at the University of Michigan and author of the forthcoming book, *The Dossier Society*.

The Sullivan bill "contains safeguards that are essential to providing our citizens with a minimal level of protection against some of the present intrusive and negligent practices of some credit bureaus," Miller said, adding that the bill "will prove doubly valuable in the computerized credit bureau environment of the future."

As for the Proxmire bill, Miller said that it "was butchered: it was drawn and quartered and its vitals were left on the committee's block."

### Urge Strengthening

Although they both termed the Sullivan bill "excellent," Gallagher and Miller both urged that it be strengthened.

Gallagher called for three changes to:

- Protect the individual from computer-generated dunning letters.
- Prevent credit bureaus from providing "sophisticated profiles of individuals in order for firms to send tailor-made junk mail."
- Restrict the type of information that can be subpoenaed from credit bureau files.

### Include Other Kinds of Files

Miller urged that the bill be broadened from credit, insurance, and employment reports to include "information collected about an individual for purposes of union membership, litigation, government benefits, or other commercial purposes."

### Nadar to Testify

Others slated to testify before the hearings conclude are Ralph Nadar, consumer protection advocate; Prof. Alan Westin, chief investigator for the National Academy of Sciences study of data banks [CW, Mar. 18]; and credit reporting industry representatives.

## Cutting Tape Marks Start Of Computerized Census

A CW News Wrap Up

Symbolic ceremonies consisting of cutting computer tape signaled the start of the census, 1970-style, around the country.

One such ceremony was held in Newark, Ohio, where Mayor James Alexander cut the tape instead of the proverbial ribbon.

The manager of the district office, one of 492 nationwide, noted that the computer tape is symbolic of the Census Bureau's modern electronic technology, which will be used to process and store census data.

But census workers in the Philadelphia area are not too happy with the computers at the Jeffersonville, Ind., headquarters.

Census forms for the area, scheduled to be mailed out by March 28th, were to have been addressed by the computers.

The commercial lists from which the addresses came, however, did not include new homes and dwelling units in fast-growing suburban areas.

In many other instances, the addresses were available, but did not get printed.

About 80,000 of the 276,000 forms for Chester and Delaware counties in Pennsylvania came through unaddressed, according to Donald M. Gross, district census manager.

William Hamilton, Montgomery and Bucks counties district manager, said that his office received about 100,000 unaddressed envelopes.

The reason given for the unaddressed envelopes was that the computer was given information it was not equipped to handle.

Hamilton said that the computer would "kick out" the forms unaddressed "even if only a couple of digits did not line up."

Both Gross and Hamilton indicated that they would finish hand-addressing the envelopes in time for the official mailing date.

Census takers were scheduled to begin canvassing the first week of April, and should complete their rounds by mid-May.

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# Gallagher Seeks Federal Data-Processing Commission

WASHINGTON, D.C. — A proposal to create a federal data-processing commission to regulate in the area of computer use has been made by Congressman Cornelius E. Gallagher (D — N.J.) in a speech before the Executive and Legislative Organization Subcommittee.

A bill proposing the commission is presently being prepared by Gallagher's office. It will be designed to cover the privacy issues that Gallagher charges are not clearly delineated in the President's recent proposal to set up an Office of Telecommunications Policy (OTP).

In an earlier speech before the Subcommittee on Government Operations, Gallagher filed a Disapproval Resolution on the President's proposal.

"My concern, and the basis of my Disapproval Resolution, is that we cannot talk of increasing the efficiency and economy of communications without, at the same time, focusing on the issue of computer privacy and the integrity of the

data flow along communications lines," he said.

## Outmoded

Gallagher warned that unless the OTP was directed to concerning itself with computer communications systems, it would be outmoded before it was established.

But if privacy concerns were tacked onto structures like the OTP without creating an independent rule-making board for governmental data processing installations, such as Canada and England are now considering, more harm than good may be done, he said.

"I suspect that it may be ultimately harmful to the cause of privacy to have it as a subsidiary interest of a group which would enable the Executive branch to act as a more effective partner in discussions of communications policy with both the Congress and the FCC," Gallagher said.

"I am disturbed at the implications of

allowing the executive to speak with a stronger voice before the FCC," he continued.

"I do not want my Committee on Government Operations to discover in a year or two that we have really approved what could be described as a domestic Gulf of Tonkin Resolution," he said.

"My deepest concern with allowing the OTP to come into existence is that it may well dilute the necessary job of establishing mechanisms to see that the computer is truly used in the public interest," Gallagher continued.

"Even if guidelines can be established and implemented by the OTP for the federal establishment, there still remains the entire private sector. Here is the basic reason I propose an independent regulatory federal data-processing commission," he said.

"We desperately need rule making to cover data banks in both the government and the private sector. To be effective,

mechanisms must cover them both. To provide rules for federal data banks and ignore private data banks would be the height of foolishness and an exercise in futility," he said.

## System Flexible

Gallagher stated that the American system was flexible enough to make these rules and regulations effective for the private sector. It should not only be able to govern data banks and communication links between repositories of personal information within the government, but it should also be designed to make rules for the hundreds of computerized information systems being developed by states, localities, and individual firms, he said.

As a first function, the commission could make a registry of all data bases in which individuals are identified, either by name or by numbering system, he said.

"I am preparing legislation for this new rule-making and implementing commission," Gallagher said.

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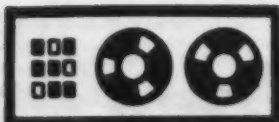
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## Traffic System A Great Success

NEW YORK — The city's experimental computerized traffic signal system is working so well that plans are being made to expand it to another 5,000 traffic lights over the next few years, according to a spokesman for New York Commissioner of Traffic Theodore Karagheuzoff.

Expansion plans were announced at a seminar entitled "Computer Techniques in Urban Management" at the opening of the annual meeting of the Institute of Electrical and Electronics Engineers (IEEE) here.

The system uses an IBM 1800 process flow computer to control the modern three-color traffic display with pedestrian "walk-don't walk" signals.

To implement the system, the computer is wired into both a central control facility and the street control box through conduit cables installed by the telephone company.

When the system is tested, programs for the traffic lights are written to control vehicles under all kinds of traffic conditions.

The chief of the Bureau of Signals, Vinson Hoddinott, said that the city has almost finished installing 500 experimental systems at intersections in Queens.

"We are satisfied that the system reduces the number of stops, decreases delays, and increases overall traveling efficiency by decreasing travel time," he added.

## Telephone Company Bills Calls Twice

MANSFIELD, Ohio — Speedy recognition of a computer operator's error didn't prevent thousands of telephone company customers from receiving double-billings for long distance calls recently.

A spokesman for United Telephone Co. (UTC) of Ohio said that a tape with 25,000 toll calls was mounted and processed twice.

The error was discovered within a few hours in a "routine accounting check," but the bills had already been mailed, the spokesman added.

UTC customers in Mansfield, Warren, and Greenville were affected.

The local business offices received copies of the double-billing, and corrections were to be made to March accounts, UTC said.



# Model 33 Users Benefit From Lease-Equity Plan

By Ronald A. Frank  
Technical News Editor

ROCKVILLE, Md. — Users of ASR Model 33 Teletype units can now obtain this equipment under a lease-equity arrangement from a non-Bell company.

Under the plan devised by Time-Sharing Terminals Inc. (TST), a user currently operating a Model 33 leased from the Bell System can replace his unit with identical equipment from TST. Both acoustically coupled and hardwired modem-connected installations can make use of the lease-equity plan.

## Communications

For acoustically coupled sites, TST will provide a Model 33, acoustic coupler, and maintenance support under a contract which requires the customer to pay about \$75/mo. This figure was said by a TST spokesman to be comparable to the rates charged by Bell.

For users with a Model 33 Teletype unit connected to a Bell 103A modem, TST will provide an EIA RS 232 interface, together with the teletypewriter and maintenance support. With this type of installation, the user would continue to rent the 103A modem from Bell. A TST spokesman said the monthly charge for this type of contract had not yet been determined, but that the figure would be competitive with Bell rates.

Contracts for both acoustically coupled and hardwired Model 33 units will run for a period of three years, with monthly payments being applied as equity. At the end of the contract period the user will own the equipment, according to TST President John C. Young.

He said that in addition to offering Model 33 users "an equity posture which they deserve," his company will provide "same day service," on all maintenance calls. Young said TST now has 16 service centers in major computer centers and

current plans call for 23 centers to be operating by September.

Asked about availability of the Model 33, Young said TST currently has 9,600 units on order from the Teletype Corp. and he said he could foresee no delivery problems for prospective users.

After the user takes title to his equipment, TST will continue to provide maintenance support either on a time and materials basis for each service call or under a fixed-price maintenance contract, Young said.

He described the service being provided by TST as "the first major marketing thrust by any company to compete with the Bell System . . . to provide sales and service to customers who are forced to pay fixed monthly charges without building any equity."

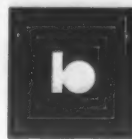
Bell presently provides Model 33 Teletype units on a rental basis whereby the user pays a continuing monthly fee without a purchase provision. The 103A modem is supplied by Bell under the same terms.

Time-Sharing Terminals Inc. is at 2351 Shady Grove Road.

## Standards Proposed

NEW YORK — The American National Standards Institute (Ansi) is currently considering proposals to standardize two communications interfaces, EIA RS-232-C: interface between data terminal equipment and data communication equipment employing serial binary data interchange; and EIA RS-366: interface between data terminal equipment and automatic calling equipment for data communication.

An Ansi spokesman said that those interested in presenting positions on these proposed standards should contact Charles A. Phillips, X3 chairman, at Ansi, 1430 Broadway. Copies of the proposed standards are available from Ansi.



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The Above Article Originally Appeared in Computerworld February 25, 1970.

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## Time Is Close

# Afips Sets May 15 Deadline for SJCC Preregistration

By Kate Rachstein  
CW Staff Writer

MONTVALE, N.J. — The American Federation of Information Processing Societies (Afips) has set a May 15 deadline on mailed preregistration for the Spring Joint Computer Conference (SJCC), the industry's semiannual extravaganza scheduled for Atlantic City's mammoth Convention Hall, May 5-7.

A new fee schedule, in effect for the first time, raises registration for nonmembers of Afips constituent societies to \$40. Full-time students and Afips members will pay \$5, with paid registration for "exhibits only" now eliminated.

Entitled "The Computer: Gathering Force of the Seventies," this spring's assembly will be the 36th of its type. Harry L. Cooke of RCA's David Sarnoff Research Center is general conference chairman. Sam Wyly, chairman of the board of University Computing Co., Dallas, has been named keynote speaker of the three-day event.

A total of 33 technical sessions, up from 29 at Las Vegas, will feature prominent figures from business, industry, education, and related professions. Through lectures, panel discussions, and question-and-answer sessions, they will cover a wide spectrum of topics.

"We've tried to identify the

trends within the industry... to make sure that we've covered those things of growing interest and importance," commented the program chairman, Dr. James Bennett of Applied Logic Corp. He cited microprogramming as one area now assuming prominence and said, "Right now's the time to talk about it."

In keeping with the conference theme, the list of topics reflects the beginning of a new decade in which the industry's interface with society will become universal. With that impact, noted Afips, comes great responsibility.

"There's been a distinct effort to see that the broader areas of humanities and social implications are covered," Bennett said, "and it reflects the maturing

industry." For example, one session on humanities will treat four areas in which EDP has influenced various art forms. Other sessions include topics such as "Social Implications" and "The Information Utility and Social Choice."

### Setting Records

With attendance expected to reach the 40,000 mark, Afips President Dr. Richard I. Tanaka has announced measures to maintain the "high quality of the exhibit program" by limiting exhibit space and upping the ante on some registration fees.

The response from firms seeking booth space has been unprecedented, according to Afips' Director of Exhibits Donald R. Cruzen. "We've received more

applications for more space than we have in the history of the operation," he said.

For the 935 available booths, his office has received about 460 applications requesting a total of 1,469 booth spaces and has a waiting list of nearly 30 firms hoping to inherit canceled space.

Cruzen said that by the time of the next joint conference in Atlantic City, an addition to the facility will enable the accommodation of the maximum 1,000 booths.

Preregistration will be confirmed by postcard. Forms are available from 1970 SJCC Registration, c/o Afips, 210 Summit Ave., Montvale, N.J. 07645. Registration after the May 15 deadline must be completed at the convention.

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For more information contact COMPUTERWORLD representative nearest you. See page 24.

## Canada Can Control Its Domestic Data

OTTAWA, Canada — The kind of information related to national sovereignty will not generally be on computers, and if it is, the government can still maintain complete control over it, according to IBM Canada Ltd. President W.V. Moore.

At a speech before the Data Processing Management Association (DPMA), Moore responded to the growing concern about U.S. access to Canadian information through the U.S.-owned subsidiaries that dominate the Canadian computer industry.

The issue was first raised by Canadian Communications Minister Eric Kierans recently when he warned of the dangers to Canadian sovereignty arising from computerized information on Canadian citizens being stored in data banks outside Canada.

Data banks are inseparable from the direction in which the country and its industry are going, Moore said.

When people talk about the future, and about the checkless and cashless society, and shopping from a TV set, they are also talking about data banks, and what is becoming called the "information society," he continued.

"There is some computer work going on between U.S. and Canadian cities, but I believe it will always remain a small proportion of the total communications-based data processing work done in Canada," he said.

Moore stated that he could find no facts to support the proposition that Canadian data banks would fall into foreign hands.

"Everyone has payroll records, personal information and other kinds of information, but it is kept where it is used. It was developed because there was an economic need, and mechanized because it was referred to often," he said.

"The implication of national sovereignty being impaired is that when such data banks are in the U.S., we will not be able to stop information being released about Canada to people outside our control," he said.

"This implies that legally binding documents such as contracts, customer correspondence and other records will form part of such a data bank and be held in the U.S., or at least be made available to the Americans without our knowledge and control," he said.

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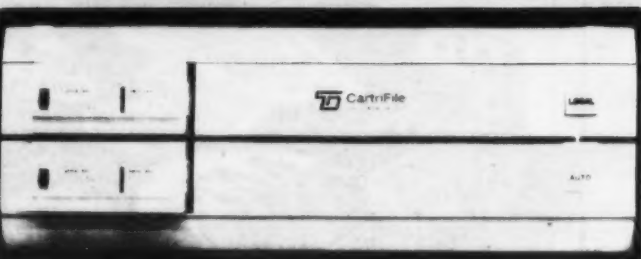
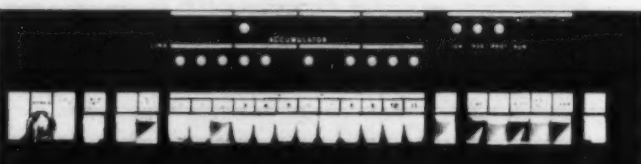
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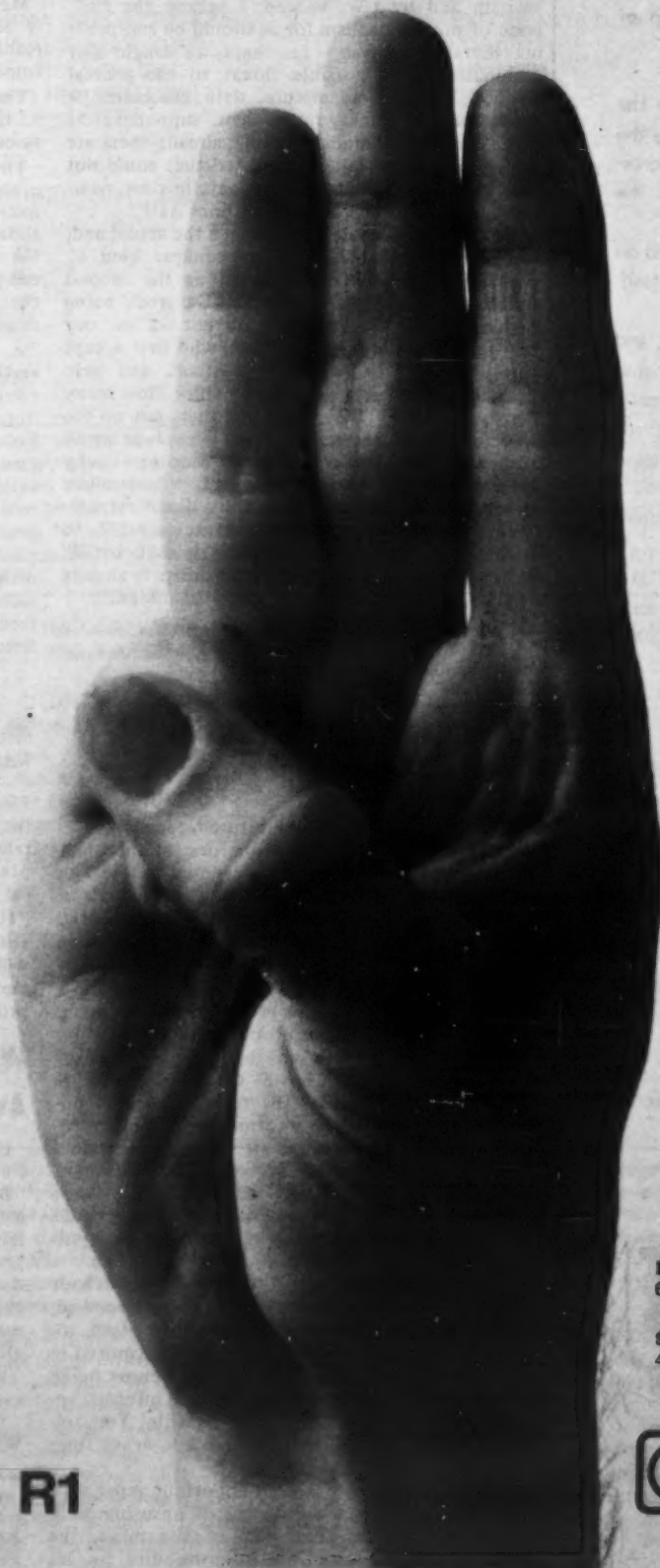
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## Editorials

### Hold the Fort

*The computer has already taken the place of God in some respects — our misdeeds are recorded in such places as banks and insurance companies. Every time we apply for credit or insurance, these recording angels are consulted and sometimes cast us into the outer darkness.*

— From an editorial,  
Olympic, Wash., *Olympian*

The distinguished National Academy of Sciences has put its prestige behind a study of computerized data banks and their effect on individual privacy and due process of law.

The project is being directed by Professor Alan F. Westin assisted by an equally distinguished group of advisers.

But the study will take more than a year.

And even when it's completed and endorsed by the Academy, any recommendations made will not carry the force of law. The Academy, under its 1863 congressional charter, serves only as an official adviser to the government.

The point is that although the study can be counted on to produce valuable information, it cannot by itself change the situation.

And there will be people who will use the study, and later its recommendations, as a pacifier. They will say: "You don't have to worry about data banks any more, the National Academy of Sciences is studying the problem," and later, "Don't worry, Congress already has recommendations from the Academy."

They will use these excuses to prevent laws from being passed now — when they're needed.

So this is no time to relax and "let Westin do it." It is now more important than before for computer people to warn public officials of the dangers of data banks and to bring abuses to public attention.



## Letters to the Editor

### Computer Professionals Must Face Responsibilities

Yes, there is a reason why the computer community is not represented in Nixon's Office of Science and Technology nor anyone else's for that matter [CW, March 4]. For years I have personally addressed myself to this problem — at our so-called professional societies meetings, letters to CW and others, on-the-job, etc. — i.e., there are no leaders because it takes guts to be a leader and, to put it strongly, ours is a predominantly gutless community!! "Don't rock the boat. That isn't my job. You scratch my back and I'll scratch yours!"

Nevertheless, until a living, working, everyday, fully committed belief in codes of professional behavior, ethics, and end-product morality analysis envelopes our community to the extent that the majority are practicing them instead of the current very small minority, we never shall have any leaders, nor be recognized and accepted as equals by our disciplines.

Myself, I totally disagree with the ancient management concept of employee loyalty that is being emphasized and propagandized so much lately — even in and by CW; instead, I believe the first code of professionalism for us should be end-product morality analysis — i.e., have we sought and eliminated every possible threat to the general public? By its very nature, data processing is super-inter-disciplinary rather than "supportive" as is the common misunderstanding; already there are activities that we take for granted that could not exist without computer technology; in time, nearly no activity will be possible without ADP.

It demands much courage to face the actual and, appalling responsibilities of our unique kind of employment — often referred to as the second industrial revolution — the operative work being revolution; the old rules just do not suffice; our real future leaders will be those who first accept the consequences of taking a stand, and help propound the sorely needed new rules. How many can honestly say they once put their job on the line for a moral/ethical systems issue; how many have been punished or dismissed for doing so; why do the majority of computer professionals allow themselves to be intimidated by their managements rather than their own consciences??? To paraphrase Stan Myers who wrote similarly in CW, March 4, to not have done these things is already to have committed "a crime against mankind."

Yvonne V. Cardemil  
Computer Professional

New York

### Campaign Against Acquiring Bank Data Should Begin

Your editorial "Political Pressure Needed" shows special cognition in recognizing one of the most serious problems facing the individual today. The potential power available to any individual or group of individuals who are privy to confidential data banks is vast. Most people would have information in their dossiers, which if taken out of context, and in the hands of malevolent third parties, give those persons great power over them.

The suggestion that the problem can be solved by the appointment of a data bank ombudsman or group of ombudsmen misses the point totally. It fails to appreciate that the most dangerous potential recipient of the information is the government itself. The danger from any individual lacking the power and sanction of government office is minimal. Since the ombudsman you suggest would be a government employee, it would be foolish indeed to expect him to act contrary to his employer's wishes.

Given the circumstances as they are, it is difficult to suggest a workable alternative to your proposal. However, *Computerworld* could direct itself toward a campaign against the data being acquired in the first place. I refer here to the census being taken now. Certainly much of the information being requested is totally unreasonable. Yet, any person refusing to answer is subject to heavy fines or imprisonment.

I am pleased to see that an important paper such as yours recognizes the danger of misusing technological progress. The man of the mind, the creator, should accept the responsibility for his

creation and assure himself that it does not fall into the hands of society's predators.

C.R. Estes

Los Angeles

We agree that the major danger from data banks comes from the government itself and that many government employees would be afraid to speak out against the government.

But not all government employees. For example, Dr. Herbert Grosch, director of the National Bureau of Standards Center for Computer Sciences and Technology, has long been outspoken on the data bank issue and would make an excellent ombudsman. Several congressional aides who have worked in this area might also be good candidates.

The bill authorizing the ombudsman should require that he be selected by a committee of interested citizens. The committee members could represent organizations known to have an interest in the field, such as Consumers Union. Ed.

### Verticle Orientation Offered In Acoustic Coupler Handsets

May I explain a point, lest your readers needlessly shy away from using acoustic couplers after reading your story "Continuing Operation Can Impede Couplers" (March 4, 1970, p. 6).

The telephone handset was ingeniously designed to force the user to hold the phone mouthpiece essentially vertical in normal use of the telephone.

This vertical orientation alleviates the packing problem of the carbon granules in the mouthpiece microphone capsule. It permits the granules to slide down *between* the two conducting ends of the capsule, rather than (when horizontally oriented) packing down against only the bottom end of the capsule and losing contact with the upper conductor.

A few manufacturers are starting to provide vertical orientation of the handset in acoustic couplers, rather than the classic "hung-up" horizontal position seen in most couplers. Our own Fone-Tone terminals have used the vertical orientation since they were introduced a year ago. Computer Transceiver's "Execuport" and IBM's new 2721 portable terminal also provide vertical position of the handset. Presumably, other manufacturers will follow suit, particularly those handling Touch-Tone frequencies, where the orientation effect is more pronounced than at the higher frequencies used in the Series 100 and 200 Data Sets used with Teletypes, etc.

Leon Davidson  
Technical Director

Metroprocessing Corporation of America  
White Plains, N.Y.

The Bell System *Technical Reference* on "Acoustic Coupling" does say: "The response of the telephone [handset] is more sensitive when the plane of the carbon transmitter is vertical . . . rather than horizontal."

However, Bell spokesmen have told CW that there is "no guarantee that the vertical position will eliminate the packing problem. Bell Labs is currently investigating the entire carbon packing problem. Ed.

### Who Knows What the Average Word Length Is?

It seems that adults are not infallible either [CW, Feb. 18].

Because of no one really knowing what the average word length is (in a R.e.s.i.s.t.o.r.s vocabulary it is seven letters, while in the average college graduate's vocabulary it is two or three letters), we decided to be less vague. Since everyone knows that a character is one key struck on a typewriter, we now have a set length for an abstract: 900 characters or 150 words averaging six letters.

We would appreciate Alan Taylor's assistance in evaluating several 900-word abstracts.

Anyway, who ever heard of a 900-word abstract? We're sure it's an English invention.

Gifford Marzoni  
President

Resistors  
Pennington, N.J.



## Fortran Is a Human Language!!

# APL - A Complex or Simple Language?

APL is an interesting language. If some signs on the horizon are to be believed, it is indeed "IBM's future language." Last month at the Share meeting in Denver, a progress report on APL attracted over 500 participants — an astonishing total considering that there were 12 other sessions going on in parallel and that the entire Share registration was only 2,500.

### Complex Character Set

Currently, it does not receive the full support that IBM provides for the major languages,

### The Taylor Report

by Alan Taylor



but this is expected to be only temporary, and that full support is down the pike.

There are many ways of looking at APL. Perhaps the best one, at least to put the thing into perspective, is to consider its character set. People are very inclined to say that it has a complicated character set, and in many ways this is true. The terminal keyboard for using APL (Figure 1) shows many signs that are basically unfamiliar to many of us. They can be seen over the numbers, and over the letters. There are signs like over struck asterisks, signs like capital "L" with a short base. Signs which have no apparent name, mixed in with others that are old familiar friends like the  $\div$  sign. It certainly seems confusing. But really it is no more confusing than learning a new form of mental arithmetic, at about the sixth grade level of work.

### Computer-Age Mental Arithmetic

This is the real point of APL, allowing users to use computer-age mental arithmetic. Sorting, as a concept, is no more difficult to understand than addition. Indeed, it is simpler than sorting numbers into order, a very elementary operation that is given in the third grade or earlier. Sorting is a very important operation which is sometimes estimated to take up about 30% of the computer power that is available.

But there is no sign for sorting in our computational languages. Simply because sorting has — up to the advent of computers — been a major task. Not because sorting was complex, or incomprehensible, but because it was not a task that could be handled normally as a single mental arithmetic step.

But, of course, with a computer to provide the mental ca-

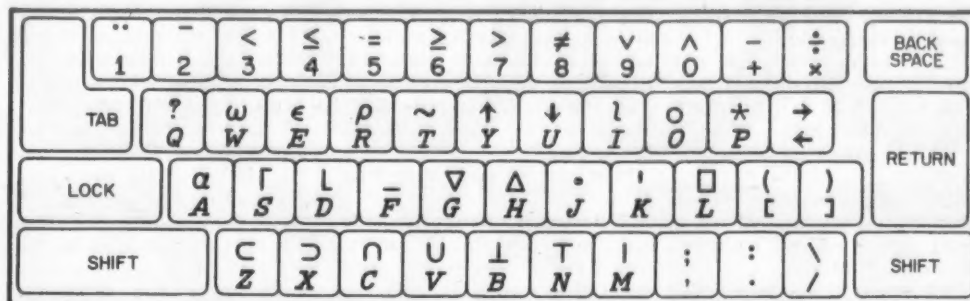


Figure 1. The standard APL keyboard is shown above, with the various specialized operators shown over the letters and numeric keys.

Fig. 2

### STANDARD APL KEYBOARD OPERATORS

#### MONADIC (UNARY OPERATORS)

IDENTITY  
SIGN  
NEGATION  
RECIPROCAL  
NATURAL EXPONENTIATION  
NATURAL LOGARITHM  
FLOOR (ROUND LOW)  
CEILING (ROUND HIGH)  
ABSOLUTE VALUE  
RANDOM  
NOT  
FACTORIAL (OR GAMMA OF B+1)

#### DYADIC (BINARY OPERATORS)

+ ADDITION  
x MULTIPLICATION  
- SUBTRACTION  
 $\div$  DIVISION  
\* EXPONENTIATION  
 $\oplus$  LOGARITHM  
L MINIMUM  
[ MAXIMUM  
| RESIDUE  
~  
! COMBINATIONS (B THINGS TAKEN A AT A TIME)  
 $\wedge$  LOGICAL AND  
 $\vee$  LOGICAL OR  
\* LOGICAL NAND  
\* LOGICAL NOR  
<> (CONVENTIONAL: 1 FOR TRUE, 0 FOR FALSE)  
= (CONVENTIONAL, INCLUDING LITERALS)

The meanings of the various APL operators are shown in Figures 2 and 3. In the first table are the standard operators which work on any numeric items. Many of these have two meanings, depending upon whether they appear connected to a single item ("Monadic" or "Unary Operators") or if they appear between two items ("Dyadic" or "Binary Operators"). Thus L 8.73, meaning "Round Low 8.73" or the "Floor 8.73," is 8.0 using the L sign in its monadic meaning. By contrast 8.73 L 9.25 means the minimum of 8.73 and 9.25 is 8.73, with no rounding taking place.

Fig. 3

### APL MIXED FUNCTIONS (NON-SCALAR) (MIXED FUNCTIONS ALWAYS INVOLVE VECTORS OR HIGHER RANK ARRAYS AS ARGUMENT OR RESULT)

#### DYADIC (BINARY OPERATORS)

#### MONADIC (UNARY OPERATORS)

INDEX GENERATION  
RAVEL  
DIMENSION VECTOR  
REVERSAL  
TRANSPOSITION

2 BANKING (INDEX-VECTOR 2 ELEMENTS)  
' CATENATION  
p RESTRUCTURE  
 $\phi$  [K] ROTATION  
 $\phi$  DYADIC TRANSPOSITION  
1 BASE (TO DECIMAL VALUE)  
T REPRESENTATION (OF DECIMAL VALUE)  
/ COMPRESSION  
\ EXPANSION  
+ TAKE  
+ ) RESTRUCTURING  
+ DROP  
e MEMBERSHIP  
[ ] INDEXING (ELEMENTS-VECTOR [INDEX])

Unlike the standard operators, the mixed function operators always operate on groups of numbers or characters, rather than on single items. Still, like the standard cases, their meaning varies according to whether they fall between items, or simply in front of a single item. In at least one case an English word has had to be practically rescued from oblivion to handle the APL needed. "Ravel" familiar to most only as the negative "unravel" means naturally enough, to put together. (Tables reproduced from *Mini-manual. A Condensed Introduction to APL*, by permission of APL-Manhattan Industrial Computer Systems, Inc.).

pability, sorting is just a simple step. And so there is no reason why it cannot be added to our computational repertoire. Any more than there is any reason why rounding down, finding a minimum, transferring numbers from seconds to days, years, minutes, hours, etc. should not also be added. Because these actions are simple with a com-

puter assist.

APL recognizes the need for adding operators that reflect the power of a human-and-computer combination. Fortran by contrast simply provides for a translation of the human language into computer terms without adding any such basic enrichment. But APL is not, through the addition of these extra oper-

ators. It can be understood by a grade-school student. It is simply a language for a human who has a computer to do some of his mental arithmetic for him.

And, as such, it may well have the great future that its proponents expect.

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## Art Strickland

## Those DP Opportunities Can Be Very Hard to Resist

The other day I ran into my friend Les Cardst, whom I had known to be a happy programmer, and he opened my eyes to a serious problem in our industry — one which, to my knowledge, has escaped serious comment.

"By God, Les, what's happened to you? I always knew you to be a happy programmer, but you look like you've been eaten, digested, and eliminated by the Great Program Bug."

"Worse than that," he groaned. "I feel like I've been run over by a CPU." He stared blankly.

I shook him by the shoulders. "What's happened, man? Von Neumann's sake, what have they done to you?"

"Oh, it's nothing really. They say I'll get over it. They say it'll pass." He was on the verge of tears.

"Tell me, Les. You've got to tell someone."

"You're right." He lowered his eyes. "They've made me a manager. Of my old department."

"No. No, Les, they couldn't have!" I exclaimed.

"Yes, of my old department." He began to blubber on my shoulder. "I didn't think the company would ever do it to

me. I thought they had (sob) respect for the individual."

"Gee, that's really tough, old boy," I commiserated. "I suppose they made it irresistible."

"Yes, I didn't have a chance." "Offered you a lot of money, huh?"

"Oh worse than that. Worse than that. They offered me a (sob) private office — with carpet on the floor."

"Where else?" I consoled him as best I could.

"With a secretary (sob) and ... and a creden ... crede-henza!"

"There, there, Les," I said as I patted the back of his head. "I understand. Now calm down, old boy, and tell me all about it." I lent him my handkerchief as he began to compose himself. "Begin at the beginning."

"Well, it all seemed so natural and harmless," he said. "When the department manager left the company last spring, our VP came to me and said: 'Les, I know you're not the senior man in this department, but you're the man I want for the job. I've been watching you. I like your dedication, Les. The way you come in late, all bloodshot from

debugging half the night. I've noticed you always take a manual to the john with you, and I like a man who conserves time. You neglect your family, Les, and I like my managers to be family men."

"Yep, the old sales pitch. You got it."

"Naturally I was frozen with fear. But I couldn't let on to him, could I? VPs don't understand that sort of thing. They don't know what they're asking

## Viewpoint

of a guy."

"It's like asking a non-com to become an officer. It's thoughtless and cruel. But you couldn't stand up to it, huh?"

"Oh, I fought it for a while. I asked for two weeks to think it over, and, boy, during those two weeks I was the louisiest management candidate you've ever seen. Why, for three whole days I didn't make a single decision. And I passed the buck no less than 184 times."

"But that didn't work?"

"Oh no. He told me I had shown I didn't make snap judgments, and that I knew how to delegate responsibility."

"Well, how did he close the deal?"

"At the end of the two weeks, he walked me into the office. It was all redecorated, new carpet, new furniture; it was terrific. He'd even asked my wife about my taste in art. The painting was fantastic!"

"Boy, he really plays dirty, doesn't he? But what's happened to you? Nobody's under that kind of physical strain."

"Oh you don't know how guys can be. The first week, just to show me who's boss, they all took vacation the same day. The second week they presented me with a list of demands."

"What kind of demands?"

"Like demanding that I make reparation for the hardships imposed on them by past management. But the worst came the fourth week. I told one of the guys it would be necessary for him to come to work mornings as well as afternoons."

"What's so bad about that? The other guys probably resent-

ed the fact that he wasn't working."

"That's what I thought. But that night they burned a cross in my yard. And the next morning there was a note on my desk threatening to take over my office if I didn't grant them all amnesty."

"But Les, you've got new scars on your face, and your arm's in a cast!"

"Oh that's from when they caught me in the parking lot two weeks ago."

"You mean they beat you up?"

"Five of them. And all because I told the VP one of our schedules had slipped. It's terrible, Art. My kids are getting picked on, my wife can't play bridge anymore ..."

"Your kids?"

"Yeah, they call them 'Junior Executives' or 'Executive Juniors' or something. One of them asked me the other night why I sold out."

"Face it, Les. It's the lot of the first line manager."

"I know, Art, I know."

"Look at it this way. It could be worse. You could be an IBM salesman."

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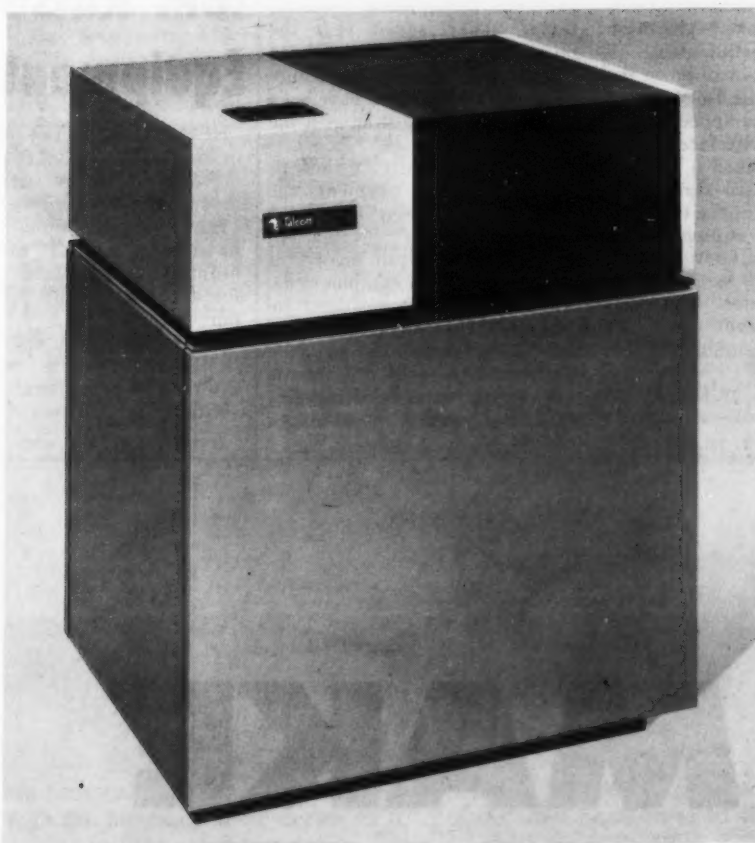
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## Talcott

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# Computer Hardware Sues Memorex — Common Product

SANTA ANA, Calif. — Computer Hardware, Inc. is suing Memorex Corp. for \$2 million for alleged misappropriation of trade secrets and unfair competition, fraud, breach of contract, common law copyright infringement, and for injunctive relief, according to James Lennane,

president.

A temporary restraining order was issued March 13, 1970, by the presiding judge for the county of Santa Clara, O. Vincent Bruno. The order read in part as follows: "... Defendants and each of them and agents and employees and as-

signs and all persons acting in concert with them, are temporarily enjoined from the data hereof, to and including March 23, 1970, until such date parties shall agree to a hearing on the motion by plaintiffs for a preliminary injunction, from selling or offering for sale by announce-

ments, advertisements or in any manner whatsoever any computer interface and supporting computer program to the IBM 1130 computer."

The equipment in contest is the Memorex Model 3610 disk storage system [CW, Feb. 18]. It is claimed to offer the user disk storage for about 20% lower cost than the equivalent IBM 2310 peripheral. Cost of the unit is \$750/mo and deliveries were scheduled to start in the second quarter of 1970.

Computer Hardware Inc. is in Sacramento, Calif., and specializes in the manufacture of peripheral equipment to extend the capability of the IBM 1120, both interface hardware and software programs. Its annual volume of business is under \$1 million. Annual volume of busi-

ness for Memorex last year was \$78 million.

Memorex's comment on the lawsuit was limited to a statement made in a memo to employees which said:

"Computer Hardware, Inc., a company located in Sacramento, has filed a suit against Memorex Corp. Computer Hardware apparently claimed that our new Model 3610 disk-storage-product was adapted from something which they disclosed to our company. The Model 3610 was announced in early February and it is a product compatible with the IBM 1130 computer. In developing and engineering the Model 3610, Memorex did not have any information allegedly disclosed to it by Computer Hardware."

## Leasco Computer and Tally Corp. Trade Suits in New York State Supreme Court

NEW YORK -- Leasco Computer Inc. and Tally Corp. have traded suits in the New York Supreme Court. The suits involve different installations and different equipment.

Leasco has filed a damage suit of nearly \$200,000 against Tally charging that 19 Tally terminals were "not fit for the purpose for which [they were] intended."

The Leasco suit charges Tally with delivering "inoperable and incompatible" equipment to Louisiana hospitals under a con-

tract with Leasco, while the Tally suit asks for \$78,000 in back payments the firm claims Leasco has owned since 1968.

Leasco claims that the equipment, as delivered, "was inoperable and incompatible with the existing computer installation with which it was to be integrated..." As a result, Leasco says, the state of Louisiana refused to make payment on the leases for the equipment.

The equipment involved in the suit consists of 19 Tally Dartex data terminals equipped with a 202C type 2 interface and a Model 735 interface.

In its suit, Leasco says it paid Tally \$160,550 for the terminals and associated equipment. It claims that Tally knew that the equipment was to be used in the Louisiana hospitals and "expressly warranted" that the equipment was suitable for that application.

The total loss to Leasco, according to the suit, amounts to \$191,193, which is the total

price of the leases with Louisiana. The suit demands a judgment for that amount, plus interest from Nov. 9, 1969, in addition to the cost of retaking, storage, and resale costs for the machines.

Tally spokesmen told CW that they "don't understand why Louisiana is not paying Leasco for the equipment installed there." They added that the problem must have been with the systems, because the equipment delivered should have been completely compatible with the planned installations.

The Tally suit demands \$78,000 in back payments the firm claims Leasco has owed since 1968.

Tally's countersuit involves a "wide variety" of equipment delivered to various customer installations under contract to Leasco during and before 1968, Tally said. It does not involve any of the equipment installed in the Louisiana hospitals, it added.

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## IBM Raises Unit Record Equipment Monthly Rental

NEW YORK — Price increases in the monthly rental charges for most unit record equipment have been announced by IBM.

Price increases were also announced in the minimum monthly maintenance charges for most unit record equipment purchased outright.

The increases will affect 48 of IBM's 600 machine types, including keypunches, sorters, verifiers, and collators.

In addition, the company an-

nounced that hourly per-call equipment maintenance charges for most of its equipment would be increased. This charge, currently \$18 to \$22 an hour, will go to \$22 to \$26 an hour.

This per-call price mainly applies to customers who have maintenance agreements and who call for assistance beyond that specified in the contract.

The changes will be effective July 1. The company attributed the changes to increased costs.

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## NCIC Helps FBI and Local Police

# Computer Nets Subject of Nationwide Manhunt

By Edward J. Bride

CW Staff Writer

WASHINGTON, D.C. — A computer search of the FBI's National Crime Information Center (NCIC) has netted a murder suspect in the small town of Winton, N.C.

The suspect is Clark Eugene Tipton, wanted for the murder of his wife and stepson in Fairborn, Ohio, last month. He had been the subject of a nationwide manhunt.

### Routine Traffic Check

Tipton was driving through Murfreesboro, N.C., late at night

and reportedly failed to stop for a police cruiser making a routine traffic check.

He was arrested for failure to have a valid driver's license, but the check with NCIC showed that he was wanted for murder in Ohio.

The list of such "hits" by the NCIC is growing rapidly, as police officials across the nation increase their knowledge and confidence in the system. A "hit" is described as a positive indication to an inquiry.

More than 1.6 million records are stored in the FBI's computer here, including over 51,000

wanted persons. Other items include stolen cars, boats, license plates, guns, and securities.

The system is connected to the police department in the District of Columbia and state police in 49 states (all but Alaska). Last year, it processed 14 million transactions, up from four million the year before.

Not all hits are as important or as dramatic as Tipton's arrest, but they all serve to increase citizen confidence. One police official said that, since the courts have reduced the time an un-charged citizen can be held for questioning, the speed and reliability of NCIC has had immeasurable benefits for both sides.

Normally, an inquiry is answered within 10 seconds, and quite frequently less than two seconds is needed for a "hit," one state police official recently said.

Pennsylvania State Police say that two lives could have been saved last year, if police had been able to question NCIC before stopping cars carrying dangerous criminals. Policemen were shot and killed when approaching the cars in two separate incidents [CW, March 4].

In both cases, the policemen were unaware that the drivers were wanted, and in both cases the policemen had their pistols holstered.

Many states are adopting their

own information systems modeled after NCIC. Pennsylvania's will be called CLEAN (Commonwealth Law Enforcement Assistance Network), and most other systems have similar titles. All will be basically a proliferation of the FBI's system at a local, rather than state level.

### FBI Success

The FBI's system has been in effect for over three years, and the busiest day was just about a year ago — March 14, 1969.

On that day, the FBI reports that over 14,000 transactions were handled within the 24-hour period.

One of the most dramatic "hits" was recorded last September, when state police in New Mexico found three men sleep-

ing in a car. The police questioned them routinely, then sent their identifications to NCIC. Within 20 seconds, they were informed that two of the men were wanted for the murder of four Cincinnati women during a bank robbery only days earlier.

Other successes have resulted in recovered stolen property, such as the case in Tampa in December, 1968.

In that case, the operator of a wrecking yard gave authorities the serial number of an automobile engine and transmission which had just been offered for sale.

The NCIC informed Florida police that the parts in question had been stolen in California, and the "stripper" was arrested.

## Medical Consultations Computerized

GLASGOW, Scotland — Patients at the Southern General Hospital here are taking part in experimental medical consultations with a computer.

Dr. Christopher Evans, an experimental psychologist, who programmed 100 questions into the machine, said that some patients prefer it to a human doctor.

The computer types out questions to patients' ailments. To reply, the patient presses keys marked 'Yes,' 'No,' and 'I don't know.' In addition, the computer always says 'please' and 'thank you' and spells questions out slowly, so that the patients do not get flustered.

"The computer which we call 'Docto' has been given a personality. It is like a person talking, and I am working on a voice for it," Evans said.

"After the interview with the computer, each patient sees a specialist, so that the computer's results and the specialists' findings can be compared," he continued.

The experiment will not be complete for several months, according to Professor Wilfrid Cad of Glasgow University, who is in charge of the project. Depending on the results, a computer might be able to collect evidence for case histories for doctors, he said.

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**Where Does Tax Money Go?****System Tells Sources of Federal Funds**

WASHINGTON, D.C. — A local time-sharing company has established a data base of the billions of dollars of federal funds available to the public for various purposes.

In all, 1,389 federal assistance programs are keyworded for access by individuals, municipalities, or any group interested in the amount of money available and procedures necessary to acquire the funds.

Applied Urbanetics, Inc., said that its AID system has already

been employed for several searches ranging from city grants for urban renewal, to university grants for purchasing expensive scientific equipment, and even for individual students looking for scholarships in various areas.

The company said that more than \$100 billion in federal assistance is categorized in its data bank.

The AID system is "entirely user-oriented," according to the company.

All interaction is in English, and the system prints out operating instructions if necessary.

The user types keywords indicating who he is, what he wants, and what he wants to use it for (such as a city seeking a grant for construction of air pollution stations).

The computer, on request, provides funding information, program description, application specifics, assistance specifics, and even the name and telephone number of a government contact.

Users with terminals pay \$450/mo for 10 hours, enough time to perform 50 to 100 searches, the company said.

People without terminals pay by the search — \$35 each or \$125 for five searches.

If a terminal user does not use all 10 hours on his device, he can use the balance in hours of federal aid specialist time doing follow-up work on his applications with federal agencies in the Capital.

**Small City Users**

Applied Urbanetics said the system was developed in response to a series of requests from mayors of small cities, all of whom said their biggest problem was money.

The AID system is said to respond to that need by showing that the computer could be useful in finding that money. The company said that the mayors were originally skeptical, but now feel that computers can be extremely useful.

Although the system was originally aimed at cities, the completed data bank contains information for individuals, profit-making companies, states and regions, and includes non-profit companies, schools, and counties.

Applied Urbanetics said that a few minutes at a terminal helps educate the user on "where all that tax money goes."

The company is at 910 17th St. NW. Demonstrations are conducted on a walk-in or reservation basis.

**No More Bureaucratic Maze**

BUFFALO, N.Y. — Gerald Leahy has high praise for the computer that Gov. Rockefeller has installed in the Motor Vehicles Department.

Leahy lost his driver's license last week and dreaded a trip he had to make to a motor vehicles office to get a replacement.

"So I went to the office," he said, "and filled out this simple form. Then I took it to a girl working the computer. She pressed a couple of buttons and bang, the computer went into action and typed out a duplicate of my license."

"The whole thing took about five minutes."

**Computer Predicts Oil Rate**

CALGARY, Canada — The Alberta Oil and Gas Conservation Board says it has developed a computer program to provide up to 25 years of forecasting for allowable production rates for as many as 200 oil pools in the province.

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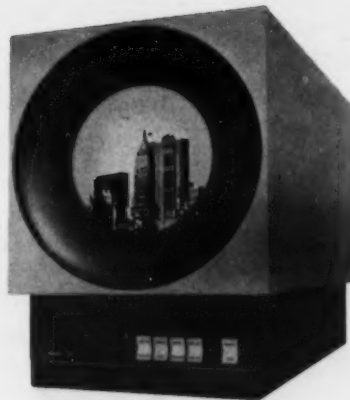
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April 1, 1970

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## Basic Compiler Package Available for Minicomputers

ARCADIA, Calif. — A 4K conversational Basic package that reportedly can be used on any minicomputer is available from

Software Associates, Inc.

The package consists of a generalized compiler and operating system, and a short special pur-

pose program to adapt the package to a minicomputer's instruction repertoire.

The package is based on the

Dartmouth College extended Basic, with the function statement omitted and new commands added for real-time and for control of peripherals used on some minis. Because Basic is a problem-oriented language, the package is expected to "help users communicate with and become accustomed to minis," according to the company.

Serving in part as an operating system, the system is core-resident but the memory consumed by the software itself is minimized by what the company calls "flexible program structure and unique packing techniques." Minis using the new package

must have a minimum 8K-byte memory.

The package is available to interested users or user groups, a spokesman for the company said, adding that rights to a particular adaptation would remain with the original purchaser. The spokesman said that he could foresee no limitation of use being placed on the buyer.

In terms of software support, the purchaser would be given the "normal 90-day warranty" from date of installation.

Price tag for adapting the package to a particular mini is \$40,000. Software Associates, Inc. is at 501 S. First Ave.

## 'Nowpower' Interrupts 1130 Processing, Permits Data Entry Without Time Loss

RIGHTON PARK, Ill. — Data for Management Decisions, Inc. (DMD) has developed a package, Nowpower, for the IBM 1130 that provides the ability to perform data entry and retrieval in real-time during normal batch processing.

Nowpower is a method of interrupting a 1130 at any time during a program run in order to initiate a different program without losing any of the time already invested in the original program, according to DMD.

After the new job is finished, the original program is restored and resumed. During the interrupt, a disk pack can be changed and system started for any job in the library, according to the company.

A special version of Nowpower will allow a CRT unit or any

other desired peripheral device to cause an interrupt and assume control. Even process control becomes possible without loss to programs in progress, the company said.

An extremely long-running program can be started and stopped as often as necessary to run in between other jobs, the firm said, to provide real-time data retrieval power.

The package can be installed on a system by inserting the self-loading deck supplied by DMD. Existing programs need no modifications; but programs stored on the 1130 in core image must be recompiled and restored, the company said.

Nowpower is available for immediate off-the-shelf delivery. The cost is \$1,100 per site with

a discount price available to multisite companies. The price includes the package, installation, instructions, and system support.

Data for Management Decisions, Inc. is at 22335 Governors Hwy.

## Routine Handles On-Line QTAM Query

MILWAUKEE, Wis. — A routine developed to permit multiple inquiries to be handled by multiple programs in an on-line system under 360/DOS QTAM is available from Rex Chainbelt, Inc., the developer.

Originally written for Rex, the subroutine is said to allow use of one partition by multiple subprograms through a roll-in/roll-out technique. Though this is similar to the method used under S/360 OS/MVT, John Ross, Rex's supervisor of corporate software and author of the new routine, said that he hasn't seen it offered elsewhere for use under DOS.

Each inquiry has a program code which is scanned as the request comes into the fore-

ground 2 message processing program. If the roll-in/roll-out executive determines that the desired phase is in core, control is passed to it. Otherwise that phase is rolled out and the required one is brought into core. Roll time is one to two seconds, depending on the size of the program phases being rolled in or out.

Particularly applicable to teleprocessing, the routine can be used anywhere that multiple subprograms must use the same core storage area on a demand basis. At Rex, it has been used for the past month and a half on an IBM S/360-40, utilizing a 20K partition within a 128K core, with IBM 2260 local terminals. Since teleprocessing inquiries take such a small percent-

age of the time available, Rex has been using the routine to allow operator intervention and spooling of programs in the remaining time.

The routine runs under DOS Release 19 or later and requires no modification of any Type 1 programs, including the supervisor, the firm said. It can operate in batch mode partition of any size, but the current version is not self-relocating. Capable of handling up to eight subprograms, written in any language using standard DOS linkage conventions, the routine takes 2500 bytes of storage.

A spokesman indicated that \$1,250 would be considered a reasonable price for the routine.

The firm is at 4701 W. Greenfield Ave.

## Cobol System Simplifies Information Retrieval

LOS ANGELES — Akseis, a data management and information retrieval system which facilitates and simplifies information retrieval, file-organization, and file-maintenance, is available from Remote Computing Corp.

Written in Cobol, Akseis (Algorithmic Key Selection, Entry, and Summarization System) is a collection of computer programs that enable a user working at a terminal on his own premises to create, maintain, and retrieve data stored in disk files, the company said.

In addition to providing flexible query and updating capabilities, Akseis is able to automatically organize input so that it can be readily accessed upon request. The system can type the program's interpretation of a question immediately after the user keys data in, thus assuring

that the question has been correctly interpreted.

Akseis can accept information stored on tape, disk, and cards, in any fixed format, and can accept new data or revisions to existing data from externally maintained files in addition to input via the teletypewriter.

Akseis can be applied to the maintenance and retrieval of data files that contain medical, administrative, manufacturing, engineering, financial, research, marketing, and countless other types of records.

The charge for the service is \$25 per hour plus disk charges at the standard rate of 1/2 cent per day per 240 characters, the firm said.

The program is available from Remote Computing Corp. at One Wilshire Building, Suite 1400.

## Package Reduces Oil Firm Accounting

NEW YORK — A software package for fuel oil distributors has been produced by Data Management Services, Inc. which reduces manual detail accounting work for degree day calculations and accounts receivable. The package minimizes errors in accounting and promotes delivery efficiency, the company claims.

The package can manipulate degree days and fuel oil consumption history and handle invoicing, aging, late notices, credit analysis, and credit limits.

The fuel oil distributor package can function in the area of batch

balancing and transaction list by batch and type. Daily reports are generated during file maintenance in one pass of the master file.

Off-line printing is possible since all report data is written on magnetic tape. The system is capable of altering all but three

fields of the master file.

The price for the package is \$20,000 and includes installation, four man-weeks of initial support, a six-month warranty, and complete documentation. Delivery is immediate.

The company is at 8 West 40th St.

## System Decreases Brokers' Paperwork

MINEOLA, N.Y. — A package to handle the back-office paperwork of brokerage houses is now available from Administrative Services, Inc. (ASI).

Developed internally by ASI, the new package is said to conform to standards set by the National Association of Security Dealers. Called an "immediate income producer" for service bureaus in metropolitan areas other than New York, the package provides overnight completion of paperwork, with confirmations mailed and updated reports delivered to the broker before the start of the next day's business, the company said.

Originally intended to overcome problems encountered by brokerages handling over-the-counter stocks, the package can also be geared to the paperwork requirements of brokers dealing with the stock exchanges. A spokesman for the developer noted that the firm's service bureau center is now handling both types of brokerages for the metropolitan New York area.

The service now requires delivery of hardcopy source documents to the bureau for keypunching.

Viatron terminals will be offered as remote access terminals.

The package operates on a

360/30 with 16K and a minimum of five tape drives. The package includes complete program documentation, the ASI Brokerage Manual and the ASI Operations Systems Guide.

Cost will vary depending on the market potential of the area in which the interested service bureau is located but will be in the \$25,000 range.

ASI said that the package can also be acquired on a lease-purchase arrangement. The developer will train key service bureau personnel in the use and sale of the system.

Inquiries can be addressed to Administrative Services at 131 Mineola Blvd.



# 'Simscrip II Plus' Language Improves Earlier Versions

WHITE PLAINS, N.Y. — A "simulation language," Simscrip II Plus, is being offered by Simulation Associates, Inc. (SAI), developer of the earlier Simscrip II. The language is designed for industrial engineers, corporate planners, and others who have an understanding of systems in their own fields but no special EDP capabilities.

Simscrip II Plus continues use of the error-correcting and "forgiving" compiler that distinguished Simscrip II from its earlier versions. Among the differences between Simscrip II Plus and earlier versions are the speed of the assembler and the more powerful processing capabilities, according to a company spokesman.

In addition, Simscrip II Plus

leaves a trace-back map as it runs. Execution errors can be quickly located and corrected with this map, said the company.

The documentation includes a textbook organized into five separate levels, each keyed to a different level of experience in simulation programming. This textbook and reference manual is published separately by Prentice-Hall. A manual from SAI is available describing the IBM 360 implementation of Simscrip II Plus.

The language can be used on a 360 with at least 256K operating under OS. Run in a multiprogramming mode, it requires a 150K partition. All versions of OS/360 are said to be fully

supported.

Simulation Associates said that Simscrip II Plus can be rewritten for other EDP systems and that "several major computer manufacturers" are planning to make the language available with their equipment.

The basic Simscrip concept

was developed by the Rand Corp. and is in the public domain. A company spokesman noted that the \$3,000 lease price includes the changes developed by Simulation Associates and complete maintenance for one year.

Maintenance in this case is ex-

pected to include new developments as well as debugging of the current offering in case of need. Price of lease renewals is expected to decrease in proportion to the length of time the program has been in use.

Simulation Associates, Inc. has offices at 600 North Broadway.

## Program Provides Construction Indices

NEW YORK — Condex21-A, a key program in a three-part system designed to standardize construction estimates and project management, has been developed by E.P.G. Computer Services, Inc.

The Condex21-A system is based on indices of material and labor costs for 138 generalized

work classifications, each broken into 30 to 150 specific job titles, by geographic area as required by the individual user. Updated quarterly by E.P.G., these indices ensure current data for the user.

Feeding the system either anticipated man-hours or dollar expenditures by job title within classification, the user gets back hard-copy reports showing detailed calculation of labor and material costs, time estimates, and unit-cost factors for comparison with other estimates, according to the company. The project summary report provides not only total direct but also indirect labor and material costs, based on percentages provided by the user.

Condex21-A is written in Fortran and designed for disk-oriented IBM 360, 1130, or Honeywell 200 systems.

Other portions of the system are technical specifications preparations, already available, and project management procedures, which E.P.G. expects to have ready in two to three months.

The three programs can be used separately or in conjunction with one another, to check for bids that are too high or too low and to develop "logical and detailed information to speed contract arrangements," according to the company.

Though a firm price is unavailable, indications are that it would be in the \$15,000 range.

### Multiple Batch Jobs Run Simultaneously

ROCHESTER, N.Y. — Computers Unlimited, Inc. has developed "Boss" (Batch Oriented Systems Service) as the most economical way of running batch jobs simultaneously in the up state New York area, according to the company.

The price for the services is based upon peripheral equipment which is used for the job.

Computers Unlimited, Inc. is at 540 Main Street East.

However, a company spokesman noted that the price would vary depending on the complexities of the individual user's needs. He also said that there would be an annual charge for the updating service, in addition to the basic purchase or rental price.

E.P.G. Computer Services Inc. is at 345 Park Ave.

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## 'Mini-Mis Plot' Translates TTY Data Into Graphics

NEW YORK — Mini-Mis Plot (MMPlot), a computer time-sharing program that is said to turn a typewriter terminal into a plotting device for translating files of business information into graphic displays, has been added to Call/360 by the (SBC).

Using this program, a businessman without an extensive knowledge of computer programming and without extra plotting equipment, can produce charts, graphs, and plots based on his own data stored in a computer, SBC said.

Subscribers using a Selectric typewriter terminal to communicate with SBC's Call/360 Basic time-sharing system can

now call on the MMPlot program to produce graphic displays with their terminals.

Since graphics provide greater impact and insights than columns of figures, MMPlot will appeal to a variety of business users including market analysts, personnel administrators, financial analysts, forecasters, and general managers, according to SBC.

### Program Supplies Graphics Data

To produce the graphics, the user instructs the computer to incorporate MMPlot into the program to be run. He then specifies the physical characteristics of the intended chart.

As the program prepares a tabulated report, it also supplies MMPlot with data to be displayed in graphics. When the user is ready to plot, he inserts a special high-resolution type font in the typewriter terminal and instructs the computer to produce the plot. In minutes, the

data is displayed in graphic form, SBC said.

The resulting graphics are said to be precise for business use since MMPlot gives a resolution of .033 in. horizontally and vertically, and can print as many as 900 dots in a square inch.

The user can get a variety of displays incorporating curves, lines, points, and scatter plots. MMPlot has a flexibility of size to a maximum of 13 by 150 inches. A simple command change expands small graphs into larger versions or alters the shape, SBC said.

On the graph, the vertical axis along the left side of the paper indicates any range of numerical quantities such as dollars, percentages, or counts.

For the horizontal scale across the paper, the user can select one of four options: months, quarters of a year, names, or numbers.

Mini-Mis Plot is available to Call/360 users at no extra charge.



Graph Produced by Mini-Mis Plot Program, Part of Call/360 Service.

## 'Job Cost' Provides Management, General Ledger Information

LOS ANGELES — An accounting system called Job Cost, that provides information for multiple levels of project management and generates, as a by-product, information for a company's general ledger, has been developed by Ancom Systems.

The system will, according to the firm, reduce accounting costs, increase accuracy, and shorten the closing cycle for users now assigning cost accounting codes manually. With Job Cost, accounting distribution codes are produced automatically, based upon job number, work order, or purchase order number.

In addition, the system can calculate and apply overhead, and generate entries for the clearing accounts.

Isolation of product and service costs enable management reviews that set standards of efficiency for materials, labor, and facilities involved, the company said.

The system will provide accounting information for the user's existing general ledger, or it will interface directly with Ancom's General Ledger System. The system is capable of handling multiple companies within a corporate structure, the company said.

The system reportedly requires no predetermined numbering structure. Completely flexible, it allows the user to assign all account numbers, organizational coding and descriptions. The user is free to change codes or descriptions when required without special programming effort, the company said.

Like the earlier General Ledger System, this system is written for the IBM 360 and requires a minimum of 32K storage and four peripheral devices, one of which must be a disk.

Ancom has priced Job Cost at \$2,500, if purchased in conjunction with the General Ledger. As a separate item it is available for \$3,500, including installation and training of user personnel.

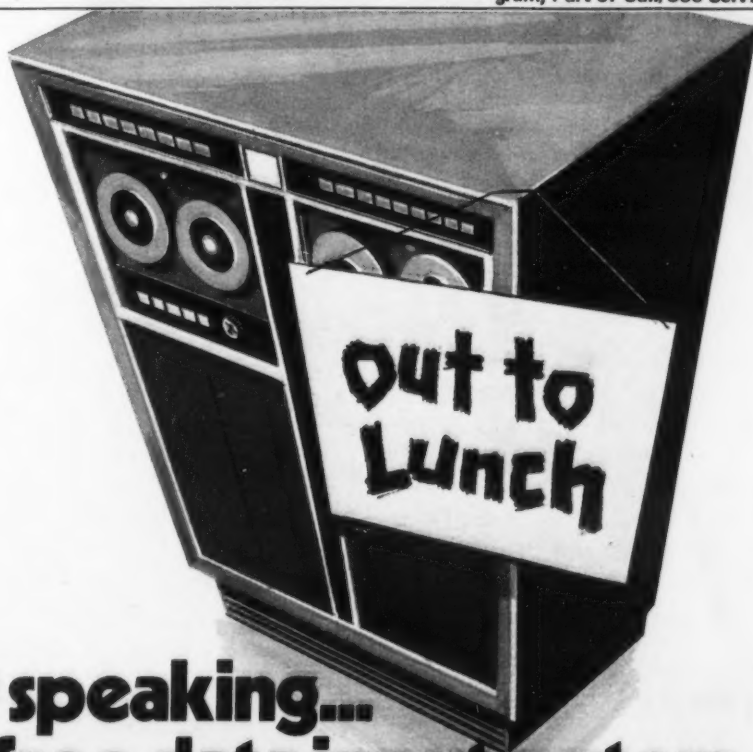
Ancom Systems, a division of Republic Corp., is at 9841 Airport Blvd.

## Programmers and Analysts To Support User Locations

ARLINGTON, Va. — Compdata is furnishing on-site systems analysts and programmers for short- or long-term assignments at user locations. The service is divided into three categories depending upon the type of machine the customer has, the language involved, and the complexity of the application.

Billing rates quoted on an hourly basis are \$10 to \$14 for simple systems, \$14 to \$17 for general systems, and \$17 to \$22 for complex systems. Within each category the rates vary according to the geographic location of the customer.

Compdata Services Corp. is at 1501 Wilson Blvd.



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## 'Uptime' Adds File Maintenance to System

WELLESLEY, Mass. — Capabilities added to Uptime now make it a combined file maintenance and report generating system, according to Automated Information Systems, Inc. (AIS), the developer.

Uptime is written in English with free form coding. It is intended to speed the professional programmer's work and to give accountants or other non-programmers a means of producing special reports. Learning time for Uptime is said to be less than four hours. Coding time may be up to five times faster than RPG, the firm said.

Originally designed only to generate reports, Uptime now provides for generation and updating of files on tape or direct access devices. In addition, the company said that the expanded

version of the language permits cataloging of data files so that, once defined, they can be called from a directory by later programs.

As a report generator, Uptime accepts card, tape, or disk input. An AIS spokesman said that computations can be made using input data, constants, or results of previous calculations, and that up to 10 total levels can be controlled.

Output can be on tape, disk, card, or printer, with automatic editing of numeric fields included for the latter device. Report titles, automatic page numbering and forms spacing, and skipping are also available for printed reports.

Files maintained by Uptime

can include fixed or variable length records, AIS said. Files on direct access devices may have either sequential or index sequential organization. Using three parameter cards, additions, deletions, or modifications can be made during a single pass.

During the file update, a print-out of all transactions is provided showing both old and new

acteristics in the form of a directory.

This directory includes file name, description of data fields, field lengths, and abbreviated search name used to reference the data. This facilitates file maintenance and minimizes programmer effort, according to AIS.

AIS spokesmen said that Uptime will run on any 360, including Model 20, with at least 16K. The Uptime system also requires three tape drives and either a disk drive or a fourth tape unit.

The package costs \$3,000, which includes installation, training of client personnel, and assistance in file cataloging.

Automated Information Systems, Inc. is at 1 Washington St.

## Software

information. Error diagnostics are also printed where applicable, according to the company.

The new cataloging feature creates a library file that stores the user's specifications of data char-

## Graphics Service Has Software Library

ANN ARBOR, Mich. — The Cyphernetics Corp. offers a range of computer graphics services supported by a staff of experienced graphics specialists. The Cyphernetics Ann Arbor center features a CalComp 718 precision drafting machine and a CalComp 765 high-speed drum plotter for graphics services.

The drafting machine is a high-speed plotting system capable of producing four-color plots up to 4-1/2 by 6 feet. The high-speed drum plotter can produce plots 11 in. wide and up to 120 ft long.

The Ann Arbor center maintains facilities for applications such as data reduction, program flow charts, financial charting, and trend analysis, survey computation and drafting, subdivision computation, structural analysis, building component design, highway design computation and drawing, bridge design, critical path method, and flow diagram preparation.

The graphics software library includes a general contouring program. This program plots

functions of two independent variables in the form of diagrams or maps and contours gravitational and magnetic fields, strata depths, barometer pressures, electric and magnetic field intensities, reactor temperatures, pressures in fluids, radiation doses, and skin temperatures.

In addition to a three-dimensional surface program with perspective and stereo features, there are three other programs. An automatic network program produces critical path method

(CPM) networks which allows the user to produce charts similar to conventional hand-drawn CPM charts; an automatic flow chart program produces diagrams directly from Fortran program source cards; and a schematic diagram drafting program capable of producing a range of electronic drawings.

The drafting machine can be leased for \$60/hr; the high-speed drum plotter at \$30/hr.

The Cyphernetics Corp. is at 333 Maple Village Center.

Marketing Applications Supported  
Through Varied 'Codimark' Services

BABSON PARK, Mass. — A computerized support system for marketing information services, called Codimark, is now available from Information Services Inc.

The system can be used in a variety of applications including fund raising, annual solicitations and capital pledges; text editing of directories, brochures, manuals or letters; publishing brochures and directories; and handling order solicitation from catalogs.

Codimark handles both paid and guaranteed subscriptions, plus credit, premiums, samples, and invoices. Inquiry systems are used for media analysis, lead development, follow-up, and sales performance evaluation.

Price varies according to customer usage. Clients can subscribe for a fee starting at \$280, plus data conversion, with no programming costs.

Information Services Inc. is in Babson Park.

## Repairman Wins Award

FT. SILL, Okla. — The Meritorious Service Medal has been presented to a computer repairman who developed time-saving computer programs for the U.S. Army Field Artillery Board.

Gregory N. Ritchey developed and implemented a computer program for data from shell bursts provided by flash-ranging instruments and computer solutions to survey problems.

## More Work for Computer

ATLANTA, Ga. — Eastern Airlines system-wide reservation computer complex will now be used to print airline tickets for direct mailing to customers at the same time it makes reservations.

The service is available to any person who calls for a reservation in advance.

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April 1, 1970

Page 25

# Printer Is 6 Times Faster Than Teletypewriters

SANTA CLARA, Calif. — A printing terminal intended to replace teletypewriter devices for users who require higher quality and faster remote printing of computer-generated data has been developed by Memorex.

The Memorex 1240 communication terminal operates, according to the company, at user

selectable speeds of 10, 15, 30, or 60 char/sec.

A comparison with some competitive devices shows that the Memorex device is from two to six times faster. Teletype terminals, for example, are rated at 10 15 char/sec, while the Digi-tronics D401 and the GE Termini-tet 300 have a rated speed of 30

char/sec.

The higher printing speed of the Memorex device is said to make it attractive to those who use time-sharing to perform commercial data processing characterized by high-volume printing requirements.

A higher degree of flexibility is provided the user by variable

speed selection. This, according to Memorex, allows the remote computing user to have a day-to-day choice of time-sharing services.

The Memorex terminal incorporates a print mechanism that is described as innovative. The device is said to have approximately 25% fewer moving parts, which Memorex said results in significantly increased reliability. Keyboard layout and print visibility have been designed to provide operator comfort and efficiency, according to the company.

The basic Memorex 1240 features a 94-character set and uses a 120-character print line. Multi-part forms up to 14-7/8 in. wide can be accommodated. A selection of type fonts are offered in interchangeable print

cartridges.

Horizontal tab set and clear features, operable either locally, or under control of a remote computer are standard, as is the capability to attach related peripheral equipment.

The unit can operate at speeds of 110, 150, 300, and 600 baud, controlled by a transmission speed select switch; and is equipped with parity checking circuitry.

The terminal can be equipped with either of two modems, either the Memorex 1220, equivalent to the Bell 103A Dataset, or the Memorex 1224, equivalent to the Bell 202C Dataset.

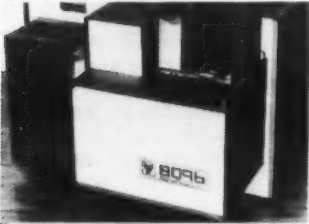
Prices for the 1240 communication terminal start at \$115/mo. First customer shipments are scheduled for the fourth quarter of 1970.

## S/3 Compatible Card Reader Handles 80,96 Column Cards

PHILADELPHIA — A plug-to-plug compatible card reader for the IBM System/3 that can handle both 80- and 96-column cards can help solve conversion problems for the user.

Developed by Bridge Data Products, Inc., the 80/96 Multiple-Card Reader is said to be designed for operation at speeds of 500, 96-column card/min., or 300 80-column card/min.

Cards are magazine-fed and the read station is adjusted automatically to the card being used by insertion of the proper hopper and stack mechanism. In addition, the card sensor consisting of a Y-shaped fiber-optics mechanism and 30 photo-electric cells is adapted to the required card format.



80/96 Multiple-Card Reader

A clutchless mechanism feeds cards from the bottom of the 1,000-card input stacker. The inject velocity corresponds to that of the drive roller velocity, and each card is read as it is driven past the read station.

Data from each card is transferred to 18 (or 12, depending on the card size being read) output data signal lines in a character column, in serial format, with column 1 leading. Each feed signal initiates the transfer of 80 columns of 12 bits, or 32 columns of 18 bits, with each data column syn-

chronized with a strobe signal to provide synchronous data transmission to the System/3.

Cards with misregistered holes are compensated for by resynchronizing a counter as soon as the off-punched hole is detected. The counter's operation is controlled by card motion, and except for resynchronization, runs free for as long as a card passes through the read head. A dynamic check of the read station operation is also made during each card cycle. All cards are stacked in the 1,000-card output hopper where the last card read is visible and accessible to the operator. The 80/96 card reader is a desk-top sized unit.

Reading of a card starts with the insertion of hopper and stacker magazines which for a given card size will select the appropriate sensor configuration.

In response to an external feed signal from the operator, the 80/96 reads data from cards punched in any code in any combination or number of holes up to the maximum hole capacity of the card.

The strobe signal will be generated during each column time period regardless of whether the column is punched or not. The timing disk is attached to the shaft of a read station drive roller, synchronizing time with card movement.

Models will be available to read either 80- or 96-column cards, or both. Prices start at about \$1,900 for the 80-column reader, which may be field-converted to either the 96-column or 80- and 96-column capability, according to the company.

The 80/96 Multiple Card Reader is scheduled to go into pro-

duction in October, and will be available thereafter on a six-week delivery schedule.

Bridge Data Products Inc. has its headquarters at 738 South 42nd St.

## Tape-Leasing Plan Updates Libraries

CLEVELAND — A magnetic tape-leasing plan that enables the user to replace his library of tapes over a three-year period is being offered by Leasepac Corporation, a disk pack leasing company.

Called Tape-Marc (Tape Management And Replacement Concept), the plan is said to provide for the purchase of the entire computer tape library of a company at book value, or a mutually agreed upon price, and the leasing back of the tapes to the customer on a scheduled basis. Under Tape-Marc, Leasepac

will immediately remove 25% of a customer's tape library for replacement with new tapes. Those tapes to be replaced are selected by the customer. Each year, for the following three years, Leasepac will repeat the process, removing 25% of the old tapes and replacing them with new ones. At the end of three years, the customer's library will be composed of relatively new and uniform tapes, according to Leasepac.

Among the advantages claimed by Leasepac for the Tape-Marc program are the following:

- Immediate cash return from the old library.
- Disposal of old or obsolete tapes.
- A way to achieve the latest "state of the art" developments in magnetic tape.
- Uniform tape densities and storage containers.
- Guaranteed price for computer tapes over a four-year period.
- Ability to forecast and budget for tape replenishment.

If a customer is starting a new tape library, Leasepac has devised a straight leasing arrangement whereby it will ship the required number of reels to a user for a specified time period, with monthly payments based on the life of the contract. Additions to Tape-Marc libraries may be handled in the same way.

Leasepac claims that the Tape-Marc plan combines the financial benefits of leasing with the advantages of improved computer operations.

The cost of the Tape-Marc service will vary from about \$.35 to \$.75 per month, per reel, depending on the type of new tape selected by the user and the value of his present tape library, the company said.

Leasepac Corporation is at 1103 Leader Bldg.

## Small Display Terminals For Time-Sharing Users

SALT LAKE CITY, Utah — Two small table-top Teletype-compatible CRT display terminals for time-sharing use are available from Beehive Electro-tech, Inc.

The Model Alpha-103 is an 800-character Teletype-interchangeable display, having a 40 char/line — 20-line storage capacity.

The Model Alpha-105, a 1,600-character display, is a direct plug-for-plug replacement for Teletype terminals, with an 80 char/line — 20-line display capability, the company said.

The stand-alone units feature a Teletype keyboard and 14 optional control keys for tabbing, four-way cursor control, text editing, and formatting. The units interface with digital printers, magnetic tape cassette devices, and on- or off-line computer communication units, the firm said.

A concealed front panel switch reportedly makes possible operation of the terminals in either local mode or as a half- or full-duplex communication device.

The user can type and edit a message using the local mode.

The terminal can then be switched to half-duplex and all, or a portion, of the message can be sent to the computer at a higher data rate, the company said.

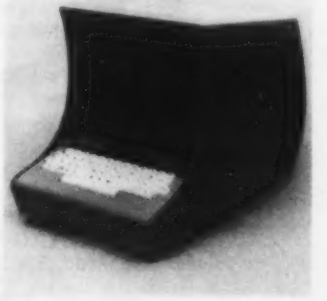
The full duplex mode is said to provide an "echoplex" capability where each character is transmitted to the computer which then sends back the character for display on the CRT screen.

Other capabilities include a three-speed data transmission switch for compatibility at 110, 150, and 300 bit/sec. An option provides a data transmission rate up to 2,400 bit/sec, with separate send-receive frequencies so that data can be transmitted to the computer at typing speeds and messages can be returned from the computer at up to 2,400 bit/sec. On special order, the company said, this capability can be extended to 9,600 bit/sec.

The terminals are EIA TV-compatible, allowing for direct connection to 24-in. TV monitors for remote viewing.

Alpha-103 prices start at \$3,495 with 30- to 60-day delivery. Alpha-105 is priced from \$4,095 with 90-day delivery.

Beehive Electro-tech, Inc. is at 1473 S. 6th West.



Alpha CRT Terminal

## Audio Unit Has 31 Word Capacity

MT. KISCO, N.Y. — A real-time audio response system that takes I-C logic levels directly, accepts BCD (binary coded decimal) code as input and interfaces with any computer is available from Cognitronics Corp., Speechmaker Division.

The Model 636 Speechmaker reportedly gives spoken answers in words, phrases, or numbers to a request for information. The unit outputs vocabularies of up to 31 words, which are stored in the Speechmaker and, on command, are spoken back singularly or in any group sequence, according to the company.

The vocabulary is stored on a revolving drum containing photographic film with up to 32 tracks — one track for each word and one for the marker pulse or silent word time.

The 636 Speechmaker costs \$1,700 plus vocabulary and computer interface if needed, and is available on a 60-day delivery schedule. A vocabulary from company archives costs \$165. Special vocabularies are also available.

Cognitronics Corp., Speechmaker Division, is at 333 N. Bedford Road.

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## CRT Portable Terminal Weighs 30 Pounds

HAUPPAUGE, N.Y. — Applied Digital Data Systems, Inc. (Addis) has announced a CRT keyboard terminal with a built-in acoustic coupler, featuring high display capacity as well as editing and formatting capabilities, and weighing only 30 pounds.

Called Envoy, the terminal displays up to 1,024 alphanumeric characters on a five-inch (measured diagonally) CRT.

According to Addis, the operation of the device is simple. The user plugs it into an electrical outlet, folds out the keyboard,

pops up the screen, inserts the telephone receiver into the acoustic coupler, and dials his computing center or service bureau.

Compatible with Teletype data communications systems, the terminal can be added to such systems without hardware or software changes, according to Addis.

The use of a commercial TV monitor in the unit is said by the manufacturer to produce legible and stable characters. The characters are black on a white display, which is claimed to reduce eyestrain.

The terminal is equipped with the Addis acoustic coupler, capable of transmitting and receiving data with a 110-300-bit/sec selectable switch. The coupler is claimed by the manufacturer to be capable of receiving signals 10 times weaker than other couplers now on the market.

The Envoy terminal can operate in any of three modes — conversational, page, and message.

In the conversational mode, the user types a character which appears on the screen as it is simultaneously transmitted.

A scroll feature rolls lines of data from the bottom to the top of the screen, like a teletypewriter.

If an error is made, the user switches the unit to an interrupt submode and then uses the cursor to correct the error. The corrected line is then automatically transmitted.

The page mode is for situations where the user wants to edit a full page of data before transmission.

The message mode is used for editing part of a page before

transmission. Editing is accomplished through the terminal's cursor, horizontal tab, and screen-erase controls.

The Addis portable terminal is available in two models. The Envoy-600 has a 512-character display capability (16 lines with 32 char/line). The Envoy-640 displays twice as much information (16 lines of 64 characters each) and has character insert/delete and formatting features.

When in the page or message mode, the Envoy-640's formatting feature enables it to display both fixed and variable data. The fixed data appears on the screen as grey characters (half intensity) while the variable data appears as black characters. Fixed data cannot be lost since the cursor and erase controls operate only in variable data fields. Only variable data is transmitted.

The Envoy-600 sells for \$3,200; the Envoy-640 for \$3,700. Initial deliveries are scheduled for June on a 90-day schedule.

Applied Digital Data Systems, Inc. is at 89 Marcus Blvd.

## Acoustic Data Coupler Unit Installs on Teletypewriters

ROYAL OAK, Mich. — An acoustical data coupler designed as a self-contained, modular unit for direct mounting on a Model 33 Teletype with plug-in connections for transmission between computers and remote terminals is available from Digital Techniques Corp.

The DTC Model 3300 data coupler, intended for permanent installation on the Model 33 in place of the normal cover plate, reportedly can be installed in less than five minutes by plugging a cable provided by Teletype into the receptacle on the bottom of the coupler and

mounting the unit in place, the company said.

No modification of the Model 33 is required, and the circuitry, contained within the compact coupler housing, is acoustically insulated from teletypewriter interference, according to Digital Techniques Corp.

Features of the Model 3300 include: a linear-frequency discriminator, automatic gain control, transistor pre-amplifier, transistorized carrier generator, and DTC magnetic pick-up.

The Model 3300 costs \$289.75. Delivery is 10 days. Digital Techniques Corp. is at 4248 Delemere Court.

## Multi-Mode Coupler Inexpensive

PALO ALTO, Calif. — A universal data coupler which permits the user to select all operating modes is available at \$298 from Prentice Electronics Corp.

With the Model DC-22 data coupler, the user can select from originate or send (terminal to terminal), full- or half-duplex, acoustic, magnetic or direct (DAA) coupling. Interfaces for teletypewriters or EIA terminals are provided.

The device allows the selection of the most frequent operating modes by pushbutton switching, and has DAA level adjustments and straps for the selection of other operating modes at its base.

The unit is available for immediate delivery.

Prentice Electronics Corp. is

located at 795 San Antonio Road.

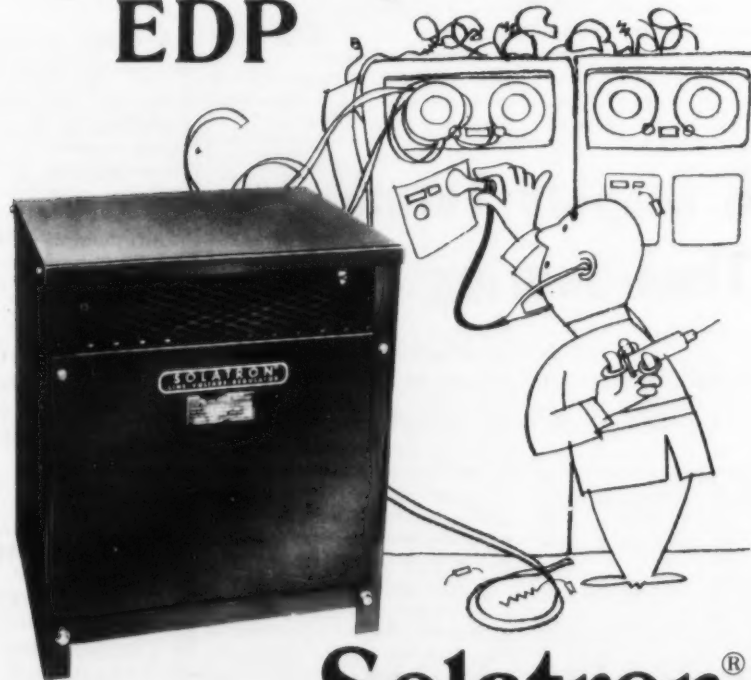
## Improved Card Reader Designed to Interface With Bell Data Phones

MOUNTAIN LAKES, N.J. — Datron Systems, Inc. has available an improved version of its Model 102 card-to-card Data Transmission Card Reader which is designed to interface with the Bell System 401-E Series Data Phone.

The 102 can read all 80 columns of a standard tab card alphanumerically. It has a select switch to read only 36 or 22 columns, and a variable input feature.

Datron Systems, Inc. is at 100 Route 46.

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The CO-70 can display 88 different symbols consisting of 62 alphanumeric characters and 26 special and punctuation symbols. The following list presents the character and symbol capability.

Upper case A B C D E F G H I J K L M N O P Q R S T U V W X Y Z  
 Lower case a b c d e f g h i j k l m n o p q r s t u v w x y z  
 Numeric 0 1 2 3 4 5 6 7 8 9  
 Symbols # \$ % & ' ( ) \* + , - . / : ; < > [ \ ] ^ \_ { | } ~

#### Physical Characteristics

##### Indicator

Screen Size 7-1/2 in. vertical  
 9-1/2 in. horizontal

Faceplate Filter 14% transmission  
 non-reflective coating

Refresh Rate 60 Hz

Color Green, P31 phosphor

Scanning System Interlaced 2:1, conventional  
 TV sweep frequencies

#### Characters

##### Size (w x h)

Normal mode 0.090 in. x 0.090 in.

Expanded mode 0.090 in. x 0.180 in.

##### Spacing

Between characters 0.010 in.

Between lines 0.120 in. (normal mode)

0.016 in. (expanded mode)

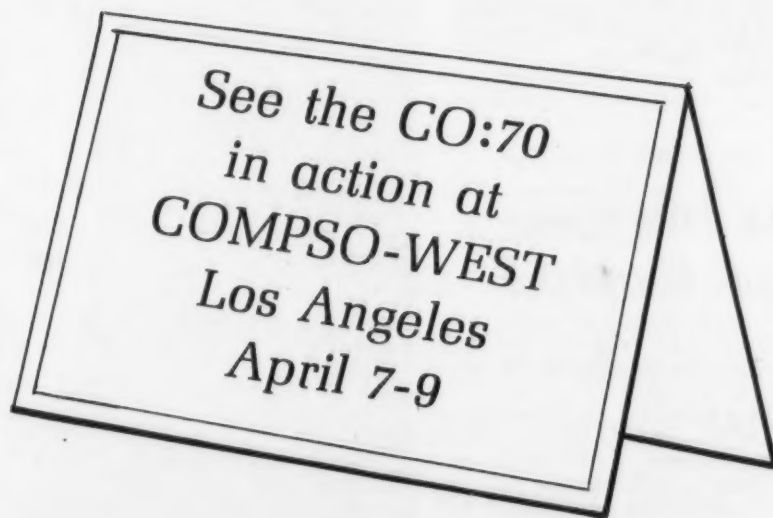
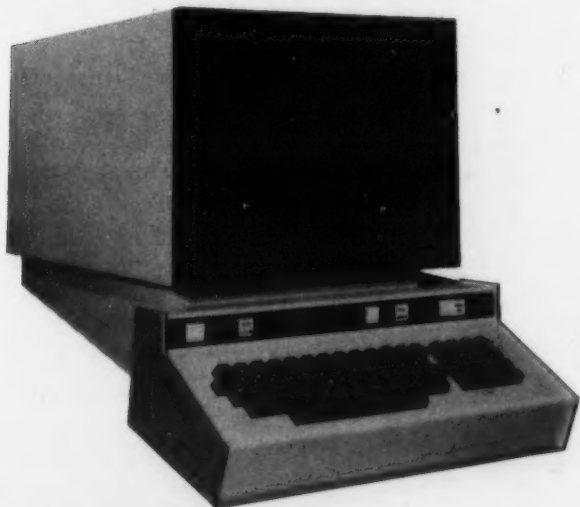
Character presentation 16 x 18 Matrix

Font Courier type, full serif

Maximum Presentation 3.000

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## Forms Burster Operates From 75 To 450 Ft/Min

DAYTON, Ohio — A forms burster with a variable speed control drive from 75 to 450 ft/min will be available in June from Standard Register Co.

The Series 1500 Burster can handle a range of paper weights in single-copy, continuous forms as well as continuous tab cards and multicopy forms, the company said.

The unit bursts single or multiple-ply continuous paper forms, up to eight copies, in a variety of widths and lengths.

### 'Swinger' Pack Rack Stores 16-22 Disks

FERNDALE, Mich. — A storage rack for disk packs is available from Engineered Data Products Inc.

Called the Swinger, the device has plastic-coated baskets that swing out for storage and retrieval of the packs. The Swinger holds 16 to 22 industry compatible packs on a 62-in. high frame.

The device features a suspension system allowing only one disk to be swung out at a time. The Swinger also allows for adjustability to various size disk packs, according to the company.

The unit costs \$199 with capacity of 16, \$235 with capacity of 22. The Swinger is available on a two- to three-week delivery schedule.

Engineered Data Products Inc. is at 930 E. Drayton Ave.



The Swinger Storage Rack

### \$198 COM Device Reads Microfiche

LA JOLLA, Calif. — A low-cost COM (computer output microfilm) microfiche reader providing magnifications up to 150 times on a curvilinear 11 by 14 in. glareproof screen will be available in June from Dioptrix Inc.

A magnification system employing a catadioptric optical system reportedly makes possible high magnification with brightness and clarity.

The terminal, which weighs less than 20 pounds, has a slightly tilted screen providing for easy viewing, according to the company. The microfiche carrier provides positive and slack-free precision movement with an indexing system designed for easy viewing by a seated operator, the company said.

The device costs \$198.

Dioptrix Inc. is at 1020 Prospect, Suite 401.

### Advisory Data Group Formed

MUSKEGON, Mich. — Eight businessmen have joined six Muskegon Community College faculty members on a newly formed data processing advisory committee.

The businessmen are to help the college learn what industry needs in data processing and advise on courses to fill those needs.

The burster can process up to 1,000 continuous tab cards per minute, according to the company.

Features of the machine include: a grouping of operating controls: power on, run, and stop buttons and a variable speed control knob; safety transparent-plastic covers with electrical interlocks;

#### dp accessories

adjustable pin belts; shielded slitter/wedger assemblies for removing margins; hand-wheel setting for form length on visual scale; fold-out packholder to keep

forms off the floor; jam detection switch; and an extra stop button at the discharge end of the machine.

The unit reportedly incorporates a static electricity eliminator, positive numerical sequence forms stacking, chip deflector fingers for tab card bursting, and a container within the unit. An auxiliary power outlet allows devices such as the Standard Register Rotary Imprinter to be plugged into the machine, according to the company.

Priced at \$3,150, the unit will be delivered starting in June. Delivery schedule will be 21 to 30 days.

The Standard Register Co. is at 626 Albany St.



1500 Burster





# Study Shows Aptitude 'Overlap' for Programmers

BROOKLYN, N.Y. — A new pamphlet, "Programming Aptitude and College Graduation," has been released by Dr. Jack M. Wolfe, president of Programming Specialists, Inc. and developer of the Aptitude Assessment Battery: Programming.

In the brochure, the third in a series on recruitment and training of EDP personnel, Wolfe attempts to discern the relationship between programming aptitude and college graduation. For the study, Wolfe's test was administered to a total of 1,420 programmers and trainees in 285 companies, institutions, and government agencies in the U.S., Canada, and Puerto Rico.

Although opinions vary on the validity of the "Wolfe test" and some note that the results serve only to confirm what they already knew, the figures may be of value to those charged with filling an increasing number of data processing positions.

## Substantial Overlap

Wolfe concludes: "Although college graduates as a group do show higher aptitude for work in programming than noncollege graduates as a group, there is actually a very substantial amount of overlap between these two groups in their

aptitude for programming.

"In scientific programming, a background of advanced mathematics is essential, and such a background is generally obtained only in college. For work on business applications of data processing, however, the requirement of college graduation is both artificial and costly with regard to the selection of personnel for programming."

## Wheat and Chaff

Wolfe also asserts: "A company that automatically excludes the noncollege graduate is actually filling some of its programming positions with less capable persons than if it considered in its selec-

tion procedures the most capable of the noncollege graduate group."

For the analysis, Wolfe compared test results of programmers and trainees with high school diplomas, one to three years of college, and college degrees.

Among college graduate programmers, he reports scoring above the median of the programmer group by 60%; among those with some college experience, 49%; and among high school graduates, 34%. Using the programmers' scores as norms, the corresponding groups of trainees scored 60%, 41%, and 26% above the median, indicating a similar pattern of superiority by groups with more advanced education.

However, personnel directors are seldom faced with the problem of hiring a complete group of college graduates as opposed to all high school graduates, Wolfe says. And because of the substantial amount of overlap between the groups,

## Education

personnel selection should aim at individualization, he says, pointing out that the top 16% of high school graduate programmers showed better aptitude for superior work in programming than 62% of the college graduate programmers.

## Natural Selection?

Wolfe attributes the differences between the trainees and corresponding groups of programmers to the weeding-out process that has already occurred among programmers, not to the programming experience itself.

He also suggests that a discriminatory policy against noncollege graduates may not be as prevalent as is often reported, as his trainee group was comprised of more noncollege graduates than college graduates.

"Other things being equal," says Wolfe, "it would appear justifiable to prefer the college graduate. But the exclusion of the noncollege graduate from consideration is not justifiable from the viewpoint of their capabilities. Although a smaller percentage of the high school graduate group will show superior aptitude for programming than the college graduate group, the actual number of such persons who can so qualify is very substantial."

Copies of the report are available from Programming Specialists, Inc., P.O. Box 160, Brooklyn, N.Y. 11234.

## ALA Approves Print Train Character Set For Impact Printers

CHICAGO — A character set for use on computer-driven impact printers handling machine-readable bibliographic information has been approved by the American Library Association (ALA).

The print train character set, based on the library character set for Roman alphabet languages developed by the Information Systems Office of the Library of Congress, is the third in a series of standards relating to the automation of bibliographic data adopted by the association's Information Science and Automation Division.

The association stated that copies of "Specifications for Library Print Train Graphics" have been sent to all "identified" manufacturers of impact printers. Additional copies are available from Don S. Culbertson, executive secretary, Information Sciences Automation Division, American Library Association, 50 E. Huron St., Chicago, Ill. 60611.

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We've delivered a computer with a new memory concept... new monolithic integrated circuitry... a new disc concept... and new standardization. A computer that lets you process data faster. For less money.

You can rent an NCR Century 100 with 16K of internal memory for \$1,910 a month. Or a 32K NCR Century 200 for \$3355. Use that as your first benchmark.

Three-way simultaneity is standard on the 100. So you can read and print at the same time program steps are being performed internally. The 200 offers five- or nine-way simultaneity.

What's more, our memory is thin film short rod memory. Ultra-fast, with speed in the 800 nanosecond range. Far faster than core memory, at lower cost. (An extra 16,000 bytes rents for only \$375 a month.)

Circuitry is integrated monolithic throughout. With more power and reliability than the hybrids, at a fraction of their size and cost.

Our dual spindle disc unit, standard on every NCR Century, stores and makes instantly available over 8.3 million characters of business information at an average access speed of 44 ms.

Input is by cards or tape. You can go on-line, too. Printing speeds range from 450 to 3,000 LPM. The top speed is standard for the NCR Century 200; optional for the 100.

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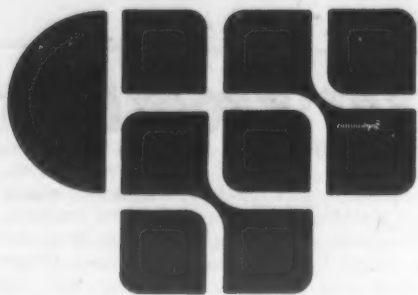
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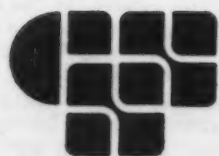
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## Experimental Keyboard, Printer Shown at Expo '70

OSAKA, Japan — An experimental keyboard and printer, capable of entering into a computer system and printing out all three Japanese alphabets plus Latin, have been developed for

bets, Latin, numeric, and punctuation. Stored in magnetic disk files, the various character images may be intermixed, the firm said.

### 16 Simultaneous Characters

Up to 16 quarter-inch-square Kanji characters may be printed simultaneously on each line, with characters formed by a series of overlapping dots creating the straight or curved lines.

The Kanji keyboard encompasses an array of 3,520 characters or symbols from the four alphabets and can be used either as an on-line input terminal for computer-controlled graphic display or to control a keypunch.

To facilitate its use, the characters or symbols are grouped in areas determined by the frequency of their common use.

The keyboard is operated by pressing each character or symbol in the array with a stylus.

Developmental work for the experimental system was done at IBM's advanced development and systems development divisions.

## Societies

demonstration by IBM at Expo '70.

On display at the firm's "Man the Problem Solver" pavilion, the Kanji (Chinese graphics) keyboard and Kanji printer are used in conjunction with a System/360. Kanji graphics are also displayed on an IBM 2250 display unit.

The printer is said to produce any of the 10,000 Kanji characters of Japan's written language at the rate of 300 16-character lines per minute. It also prints two Japanese phonetic alpha-

## smtwtfs calendar smtwtfs

April 2-3, New York — Andover Systems Education Corp. presentations on "Decision Tables." Also "Cobol Workshop" on April 6-10 and "Effective Systems and Programming Management" on April 15-16. Contact: Paul Durand, Andover Systems Education Corp., 207 E. 37th St., New York, N.Y. 10016.

April 6-7, New York — A course entitled "Simulation of Computer Decisions." Also in Chicago on April 9-10. Contact: Mrs. Myrna Stock, Simulation Associates Inc., 600 N. Broadway, White Plains, N.Y. 10603.

April 6-8, Athens, Ga. — The Second Annual Georgia-Reliance Symposium on Automation and Society will discuss management responsibility in automation. Contact: Charles Yoder, Charles Yoder & Co., 2 Commerce Park Square, 23200 Chagrin Blvd., Cleveland, Ohio 44122.

April 6-10, New York — American Management Association presentation on "Basic Systems Procedures," and in San Francisco, a course on "Senior Systems." Contact: American Man-

agement Association, Inc., The AMA Bldg., 135 W. 50th St., New York, N.Y. 10020.

April 6-10, New York — A systems training seminar entitled "Total Immersion in Systems" presented by Systemation, Inc. Also on April 20-24 in Atlanta, Ga. Contact: Systemation Inc., P.O. Box 730, Colorado Springs, Colo. 80901.

April 7, New York — First of three lectures in an ACM seminar on Command Languages for On-Line Systems. Remaining presentations on April 14, 21. Contact: Carl Hull, Bristol-Myers Co., 345 Park Ave., 10022.

April 8, Burlington, Mass. — Boston Chapter DPMA in conjunction with Sierra Research Corp., presenting a seminar entitled "End Data Pollution by Automating Source Data Input." Contact: CG 70 International Corp., 140 Federal St., Boston, Mass. 02107.

April 14-16, Uxbridge, England — The 1970 Computer Graphics International Symposium at Brunel University. Contact: CG 70 International Symposium, Brunel University, Dept. of Computer Science, Uxbridge, Middlesex, England.

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## Career Paths, Compensation, Training Seen as Plugs to EDP Personnel Drain

By Kate Rachstein  
CW Education Editor

NEW YORK — Findings of recent surveys on EDP personnel turnover are a matter of concern to nearly all DP managers. However, one "peopleware" director, Joseph Surkis of Oyer Professional Computer Services, feels that the key to a more stable personnel environment may lie with management.

One major study of nearly 500 U.S. firms was conducted by the Diebold Research Program and reported by Surkis [CW, Feb. 11]. Among other things, it indicated that:

- Salary level has a great impact on the turnover rate of college-educated programmers and almost none among those without college degrees.

- The existence of a formal in-house educational program has little effect on the turnover rate of college-educated systems analysts; some positive impact on college-educated programmers; and is the only real favorable influence on those without college degrees.

Surkis maintains, however, that turnover rates, even among the hard-to-hang-onto, college-educated systems analysts, may be

retarded by a management team aware of its options.

### The Tie That Binds

Closed avenues of advancement, stagnant salary schedules, and unresponsive education programs may all offer inducement to wander, but some combination of these same elements, handled imaginatively, should provide a measure of stability to degreed and degreedless programmers and analysts alike.

Surkis views the development of career paths as one effective

means of stemming the tide of personnel drifting into software, consulting, and facilities-management houses.

One alternative would allow data processing personnel to become true professionals and technicians in such sophisticated, well-paid positions as senior analysts and programmers. A second path would allow for growth in management of EDP facilities through positions in analysis or programming supervision. And a third would allow

(Continued on Page 32)

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# Responsive Management May Retard EDP Manpower Exodus

(Continued from Page 31)  
for branching into corporate line-management positions, a move viewed as particularly attractive by many college-edu-

cated systems analysts.

Skillful career-path plotting is instrumental to an internal development effort, says Surkis, who suggests the following:

- Ask each individual what job title he would like to have one, three, and five years from now.
- Ask him what experience and education he needs to qualify for each.

- Record his information and ask his supervisor whether the goals are realistic ones. If so, plan and schedule the employee for the experience and education he wants.

For realistic performance evaluation, Surkis offers these guidelines:

- Review a programmer's specification and evaluate his performance against it. It's possible that a poor specification may have given his work an undeserved poor facade.

- Do not hire a programmer by one set of criteria and evaluate him against another.

- Measure him against his job description and performance standards, being certain that he has a copy of both and knows they are being employed in his evaluation.

- Do not evaluate performance by a programmer's ability

to estimate production dates. The twain between programming and estimating may never meet, leaving programming ability unrecognized.

## Compensation

Various forms of compensation offer a second hedge against defection by other members of the team.

Monetary inducement is usually considered first, and in the case of the college-educated, this priority is clearly justified. For them, Surkis suggests "riding the crest" of the salary curve, if possible.

As a rule, degreeless EDP personnel will be less responsive to this approach. Since many of them have come up through company ranks and have trained with the firm, they tend to view their current positions as promotions and career openings. Thus, other more satisfying rewards may be based on local conditions, job classification, or training programs.

Whatever the approach, Surkis says, it must be internally con-

sistent and aligned with the workers' expectations.

## In-House Training

Because of its decided appeal to non-college programmers and because it represents a substantial commitment of time and resources, great care should be exercised in shaping in-house training and education services, he says.

A hasty assessment of need by employees or management may jeopardize a program's effectiveness. The in-house effort should coordinate the firm's time-phased corporate plans, the jointly developed career-path plans, and employee capabilities, as determined by skills inventory questionnaires and objective tests.

This management-employee interaction will yield additional benefits, Surkis feels, by promoting participation in the decision-making process and demonstrating concern for personal satisfaction — both effective tools in motivating and retaining EDP personnel.

## Call for Papers

1970 IEEE SYMPOSIUM, Nov. 12-13, Winter Park, Fla.

The theme of the symposium is engineering systems in education and training. Its purpose is to assess and expand the role of engineering systems in these fields.

Topics suggested are: the engineer as bridge between research and its application to human problems; design of an instructional system — its elements and dimensions; the dimensions of the education and training problem; human values in engineering design; cybernetic principles of learning system design; computer modeling of human behavior; and the impact of technology on education requirements.

Submit a summary of sufficient detail to serve for selection review. Preferred length is one page, two pages maximum, and may include illustrations and graphs but no photographs. Single space text body, leaving a 3/4-in. margin on all sides.

Final papers should lend themselves to a 20-minute oral presentation. Summaries must be submitted by May 15 to Mr. S.E. Michaels, Bell Telephone Laboratories, Room 3d-529, Holmdel, N.J. 07733.

SIXTH ANNUAL CONFERENCE

ON THE USE OF DIGITAL COMPUTERS IN PROCESS CONTROL, Feb. 17-19, Baton Rouge, La.

Topics of interest include computer control hardware and software, interfacing, digital sensors and control elements, digital control algorithms and techniques, supervisory systems, and direct digital conversion.

Authors are requested to submit an abstract for consideration to Dr. Cecil L. Smith, Chemical Engineering Dept., Louisiana State University, Baton Rouge, La. 70803 by July 12.

1970 EASCON, Oct. 26-28, Washington, D.C.

The principal theme will be Technology and the Course of Mankind.

Eight topic themes are planned: the impact of computers on society, data aspects of application satellite systems, urban problems, international technology and programs, electrography, radar and optical systems for society, and military communications and effect on civil life.

Authors are invited to submit abstracts (four copies, 500 to 1,000 words in length) of proposed papers on the above topics before May 2.

Address correspondence to Dr. Richard Marsten, Nasa Headquarters, Code SC, Washington, D.C. 20546.



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April 1, 1970

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## Fourth Generation Breakthrough?

# APT Develops Process for Commercial Optical Memory

By Harvey Elman  
CW Staff Writer

LAS VEGAS — Advanced Patent Technology, Inc. (APT) has fabricated a ferro-electric crystalline material, which it claims makes electro-optical computer memories feasible. According to the company, this may be the key to developing fourth generation computers.

George D. Gregory, vice-president of engineering, said that, as

a result, "we're virtually certain we can build an optical memory for a computer, and beyond that, we can build an optical computer which will revolutionize the entire industry."

The physical process, or vehicle, by which a commercial optical memory may be devised is being demonstrated, agreed APT Vice-President Alvin A. Snaper.

The development consists of

the fabrication of a thin film of rare earth ferro-electric crystalline material by RF sputtering on a quartz substrate.

The material provides the basis for a computer memory component which will change and hold the condition of polarized light as its storage medium. Significant, said Snaper, is the film's ability to erase information and change its condition at the speed of light.

APT had considered several methods of producing crystals of the necessary purity, but aimed its research principally at RF sputtering, which involves building up sandwich-like layers of crystal materials on a thin film substrate by means of an RF field in a vacuum chamber.

Verified by an independent research lab, Sloan Research Industries, Inc., Santa Barbara, Calif., the substance is composed of barium titanate on a quartz substrate.

In the electro-optical memory, information is stored on the substrate layers by light impulses which create selected areas of optical polarization or, in effect, "optical holes" for digital data storage. The data would also be retrieved optically.

Expected by APT to offer speeds in the range of 10 to 100 nsec at a cost of one to 10 cents a bit, the electro-optical system could make major inroads into the memory market, said

Gregory. He estimated the market to be about \$500 million this year with increases of 15% annually.

A memory unit prototype using the new substance will be completed within nine months, and manufacturing operations will begin by early 1971, according to Gregory. APT is negotiating with Computer Complex, a Houston time-sharing firm, for a joint venture to develop an electro-optic computer. "Right now," said Gregory, "we would have to downgrade our memory to work with conventional electronic computers."

"We envision something like a scientific computer with a 16-bit, 8K-memory the size of a desk-top calculator," he said, "in the price range where classrooms can begin to afford them. And we're also aiming towards a computer in every home. Why not?"

APT, which now has 17 employees exclusively in R&D, will manufacture the memories in Las Vegas.

## 'Pirate Ship' S. S. California Expected To House Orphan Exhibits, Enliven SJCC

By Phyllis Huggins  
CW West Coast Bureau

SAN FRANCISCO — "I was just standing there minding my own business when three security guards charged up, grabbed me by both arms, and dragged me into a vice-president's office." If this incident is indicative of the type of excitement the S.S. California generates, then the SJCC may be in for more than its share, as an enterprising advertising/public relations firm plans to invade the Atlantic City conference with a "pirate ship."

The innocent gentleman who was attacked by the guards was minding his own business, although attired in full pirate regalia, including cutlass and wine bottle, and was in the process of inviting Philco Corp. to a planning luncheon. At another building, he was told to return when suitably dressed.

But this was only the beginning as the Comsys Agency, a division of Comsys Corp., a Bay Area communications firm, launched the most audacious and innovative idea to hit a JCC in some time.

It all began when one of Comsys's clients was unable to get space in the exhibit area. The agency, with tongue-in-cheek,

then proposed to other disappointed exhibitors that they rent a ship and put on an all-California show at the Conference.

Not limiting themselves to just the EDP industry, they also invited typical California representatives such as the wine growers, vegetable associations, resort centers, and even obtained official sanction from Gov. Ronald Reagan's office. The "fun" idea became serious work, and at a planning luncheon attended by 22 companies, 22 letters of intent were received for space.

Also at the lunch were two burly men who arrived with two big boxes of artichokes which were distributed to the guests and used as table decor. This was a gesture of support from the California Artichoke Association.

As plans now stand, Comsys has confirmed with the harbor-master at Atlantic City that docking space is available, and arrangements have been made with two potential ships; one a 135-ft sloop, the other, a 110-ft vessel.

Afips has said that it can't officially sanction the ship exhibit but won't block it either. In fact, Don Cruzon, Afips exhibit manager, said: "If you're too successful, I may have to

write you a letter."

In addition to the EDP firms, the California wine growers will supply wine, the Dune Buggy Association will supply dune buggies to take guests from the hotel to the ship, and a resort center is planning a surprise. Oh, yes, there will be artichokes for everyone.

## Handy-Capper Updates Golf Handicap Within Ten Seconds, Records Scores

By Harvey Elman  
CW Staff Writer

FARMINGDALE, N.Y. — The pro shop or locker room of your local golf course or club will shortly have available a table model computer designed to provide on-the-scene updating of a golfer's handicap after each round, according to its maker, Controlotron Corp.

Joseph Baumel, Controlotron president, said that his company's subsidiary, Sports Computer Corp., which developed the special purpose unit, expects the production units to be available in a little over a month.

The digital computer, appropriately designated the Handy-Capper, uses individual cards for each subscribing golfer. These cards contain a permanent record of all scores (regardless of course played) from which the golfer's handicap is computed.

After a round of golf, the player inserts his card into the Handy-Capper, sets the score dials for the round just played

and enters this data. The computer then punches a hole pattern on the card representing the new score and then reads the previous scores recorded on the card.

Within 10 seconds the player's handicap, accurately computed

to USGA rules, is displayed in the Handicap window. The handicap can be verified at any time on any Handy-Capper, even at a different club.

The Handy-Capper will be available to golf clubs and sports organizations on a lease basis.

## Detroit Voters Accept Votomatic

DETROIT — Ninety percent of voters in a recent local election say that IBM's Votomatic system is simpler than the common automatic voting machines.

This fact, city clerk George Edwards reported, makes him "favorably disposed" towards recommending acquisition.

Edwards is looking for a solution to overcrowded ballots [CW, March 4], but the two companies vying for the local contract still have not come up with a proposed alteration to increase the system's capacity from 235 candidates.

Computer Election Systems (CES) and Datamedia, both bidding for the Detroit contract, if it ever materializes, will make a presentation to the city council soon. Edwards said that any recommendation on the acquisition of the system will prob-

ably stem from that demonstration.

The city clerk was encouraged by the successful results of a six-month study of Votomatic's reported vulnerability to error or fraud. The study was conducted by the Los Angeles County Election Security Committee, and the results were recently made public [CW, March 11].

The study concluded that, with internal and external safety precautions, the system would be reliable, and attempted fraud could probably be detected.

Although IBM no longer markets Votomatic, several companies, like CES and Datamedia, have been authorized to sell and service the units on a franchise basis. Many of these companies are staffed by former IBM employees who worked as Votomatic salesmen or repairmen.

## Telex To Buy \$25 Million of CDC Computer Printers; Payment by '78

MINNEAPOLIS — Control Data Corp. (CDC) has signed an agreement with the Telex Corp., Tulsa, Oklahoma, for the purchase by Telex of high-speed computer printers manufactured by CDC.

The agreement provides for the purchase of the printers over an eight-year period at a total price in excess of \$25 million with shipments expected to begin in 1970. The controller to be used

with the printer is to be designed and manufactured by Telex.

A producer of large-scale computer systems, CDC is also the major supplier of peripheral equipment to other computer manufacturers.

Telex manufactures digital tape drives, and markets a broad range of electronic products including disk pack drives, communications equipment, tape recorders, and instrumentation equipment and systems.

## Auerbach Okays Automated Systems, Quits Bakkenist

PHILADELPHIA — Auerbach Corp., an international computer systems design, consulting, and publishing organization, has acquired Automated Systems Corp., Washington, D.C., for an exchange of privately held stock.

Automated Systems Corp. provides personnel and capability in contract and applications programming and program implementation. The firm will be operated under the name of Automated Systems Corp. as a division of Auerbach Assoc. Inc.,

the consulting subsidiary of Auerbach Corp., according to E. Hugh Kinney, vice-president and general manager of Auerbach Assoc.

### End Bakkenist Pact

In another Auerbach announcement, the company has terminated participation in Bakkenist Auerbach, N.V., an EDP consulting firm with headquarters in Amsterdam, the Netherlands, according to Isaac L. Auerbach, company president.

Bakkenist Auerbach N.V. was formed in February, 1968, as a joint venture between Auerbach and Bakkenist, Spits & Co., a management consulting firm with offices in the Netherlands.

All Auerbach shares have reportedly been sold to principals of Bakkenist, Spits & Co. Following completion of current projects, Auerbach will no longer provide technical or personnel support from its staff.

Prior to establishment of a new continental office, Auerbach consulting groups will continue to serve the European market from its London and New York offices.

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## Systems Opens New Engineering Lab

FORT LAUDERDALE, Fla. — Systems Engineering Laboratories, Inc. has established a new 16,000-sq-ft engineering development laboratory here.

Systems, which has grown from three founders in 1961 to more than 1,000 employees, now has seven facilities in the Fort Lauderdale area, sales and service offices in major cities across the U.S., and subsidiaries in Pennsylvania, Puerto Rico, Canada, and Europe.

The new engineering laboratory increases the company's facilities in the Fort Lauderdale area to about 150,000 sq ft. At the new location, there will be three laboratories for the development of Systems real-time computers and related data acquisition and control equipment, as well as facilities for central engineering records and design drafting.

Besides the new engineering building, Systems area facilities also include corporate headquarters, computer systems manufacturing, printed circuit card manufacturing, an education center, general warehousing, and custom systems assembly and development.

Systems develops, manufactures, and markets real-time computers, related data acquisition equipment, and a computer-based keyboard data entry system.

### Tulsatronics Expands Into Alaskan Project

TULSA, Okla. — Tulsatronics Computing Corp.'s planned ex-

pansion into the Alaskan project will be a joint venture for which it is now seeking added capital.

The Alaskan project will be a joint venture with a Canadian-based scientific computing com-

## Expansions

pany, the exclusive use of computer hardware presently available in Anchorage is one of the significant elements in the plan.

Plans also exist for opening a West Coast office to serve national auditing firms and to do preliminary development work on a medical diagnostic system.

Tulsatronics is a full-service data processing company which offers programming support, manpower services, time-sharing, and arrangement for use of common facilities.

### Other Expansions

United Data Centers, Inc., formerly at 575 Lexington Ave., New York, has moved to larger offices at 100 Putnam Green, Greenwich, Conn.

Tymshare, Inc. has opened a district office at 125-12th St., Suite 102, Oakland, Calif., which will provide marketing and technical services support for subscribers in San Francisco, Oakland, and other northern California and Nevada areas.

Applied Logic Corp., Princeton, N.J., has opened a new

Al/Com service center at Suite 310, 7315 Wisconsin Ave., Bethesda, Md., for the capital district area. The center will provide local marketing and technical support for users of the Al/Com computer time-sharing network.

Multidata Inc. of Westminster, Calif., has opened a Northeastern office at 520 Main St. in Waltham, Mass.

Sterling Computer Systems' Los Angeles Service Bureau Division is now in a 10,000-sq-ft modern building at 1930 Beverly Blvd. The new facility houses Honeywell 200 and 120 and IBM 360 data processing hardware.

International Reservations Corp., a computer-based hotel and auto rental reservation organization in Los Angeles has moved to a 17,000-sq-ft office in the Ventura-Woodley Building at 16055 Ventura Blvd., Encino, Calif.

## Contracts

Index Geophysical Surveys Corp. of Houston has signed a contract with Royal Resources Corp. and the Colorado Corp. to perform marine seismic surveying off the coast of Liberia. Index will utilize its diesel-powered Vast Explorer I, a 150-ft seismic research vessel equipped with digital seismic instrumentation and air-gun energy source, to perform reconnaissance work.

Com/Code Corp., Washington, D.C., has been awarded a contract by the Naval Ship Systems Command Department of the Navy to develop a computer program for the structural analysis of longitudinally framed ships with the additional capability of checking local stability.

Astrodata has received contracts from two divisions of Pan American Petroleum Corp. The contracts are for Supervisory Monitor and Remote Telemetry

to oil and gas production (Smart). Pan American's Houston Division will utilize the system to perform the functions of surveillance, data gathering, and control of producing wells, central tank batteries, well test, salt water disposal, gas collection, gas lift systems, and automatic custody transfer units. The Denver Division will use the Smart system to automatically monitor 100 oil wells for out-of-limit conditions and report by radio to the system's computer.

National Software Exchange, Inc. has signed a contract with PDA Systems, Inc., New York, which calls for NSE to market two PDA programs — Allstat and Bal-Fix.

QED Systems, Inc. has been awarded a contract by Magnavox Corp., Fort Wayne, Ind., to provide fault isolation test procedures for automated testing of digital-integrated circuit cards.

## Orders and Installations

The U.S. Department of Housing and Urban Development (HUD) has ordered a \$3.3-million Univac 1106-9300 to keep pace with its expanding role in stimulating housing production and revitalizing the nation's cities.

Life, an Ecuadorian subsidiary of Dow Chemical Corp., ordered a Univac 9200-II to be installed

at its computer center in Quinto. SMC Computer Services, Inc. of Dallas, has ordered a Univac 9300 for installation in its Fort Worth, Texas, facility.

Applied Dynamics, Ann Arbor, Mich., has received an order from Akzo/Enka (Netherlands) for its new AD/Five analog/hybrid system.

Information and Communication Applications, Inc., Silver Spring, Md., has received 11 data conversion orders. The new orders in the metropolitan Washington area include Kiplinger Publishers, Inc.; Computer Data Systems Corp.; Compu-share; the D.C. Metropolitan Police Department; and General Services Administration.

Internationale Atomreaktorbau GmbH (Interatom), Bensberg, West Germany, has ordered a Control Data 6400 system to handle technical and scientific calculations supporting the development of nuclear reactors for power generation.

The Royal Military College of Science, Shrivenham, England, one of the Ministry of Defense's principal colleges, has ordered a 1902A from International Computers Ltd. of London. A wide variety of problems including transportation studies, gaming, simulations, engineering calculations, time-tabling, and scheduling will be undertaken by the computer.

A \$2.5-million Univac 1108, which has a main memory of 131K words, has been installed at Satellite Computer Service, Philadelphia, Pa. Peripheral equipment in the system includes eight magnetic tape units, a high-speed printer, a Fastrand II mass storage system, and a data communications subsystem.

General Computer Systems of Dallas has received four orders for its Data/Tape 2100, a multi-station system that ties in with a strip printer to display characters being keyed. This key-to-tape unit provides hard copy.

General Computer Systems has marketed the system to Scanning Co. of America, Hackensack, N.J.; Michigan Blue Shield, Detroit; Halal's Computer Service, and Reliable Key Punch, both of Los Angeles.

M.H. Smith Public Accountant firm, Myrtle Beach, S.C., has installed an IBM 360/20 including a 2560 multifunction card machine, and an IBM 2230 printer.

The following companies have installed or ordered Honeywell systems. The Ealing Corp., Cambridge, Mass., has ordered a Model 120 mixed disk-magnetic system to handle order processing, inventory reporting, and invoicing. The First United Super-Market Services Inc., Canton, Mass., will use a Model 120 disk-oriented system for billing, sales order processing, inventory control, and sales analysis. A Model 125 magnetic tape-oriented system to handle merchandise control, dollar classification control, and sales analysis has been ordered by Giant Stores Corp., Lowell, Mass. The J.N. Ceazan Co., Los Angeles, will use the Model 120 disk-oriented system with seven CRT display units for on-line inventory inquiry and order entry. The Model 110 disk-oriented system will be utilized by Papercraft Specialty Co., Los Angeles, to process orders, accounts receivable and payroll.

Data-Comp Systems, Inc., has ordered the NCR version of the proprietary Delta Accounts Receivable System from Delta Data Systems. Key features of the system include processing of both balance forward and open item accounts for multiple companies; automatic calculating of trade discounts, net amounts and service charges, automatic aging of accounts receivable, preparing of invoices and monthly statements, and applying cash to current 30-, 60-, or 90-day balance on balance forward accounts.

## Acquisitions

National Information Systems Corp. (NIS), Valley Forge, Pa., has acquired controlling interest in Mastech Computer Systems, Inc. Chicago. Mastech is a consulting, computer systems design and engineering corporation. It recently entered into the proprietary software marketplace with three major products servicing the accounting, mass marketing, and data processing communities. NIS specializes in consulting, systems design, installation, and operation of large-scale industry-oriented computer-based systems.

Aquitaine Oil Corp., Houston, has purchased about 45% of First Business Computing, for an undisclosed amount of cash. FBC provides technical services for oil and gas customers in seismic exploration.

Planning Research Corp., Los Angeles, has agreed in principle to acquire William E. Hill & Co., Inc. Hill provides management consulting services to management in industrial and commercial enterprises; banks, insurance, educational, and other nonprofit institutions.

Service Technology Corp., previously owned by Computer Technology Inc., has been sold to LTV Aerospace Corp. LTV paid \$2,234,000 for the firm which specializes in electronics engineering, technical, maintenance, and other support services to various governmental agencies.

Teletronics, Inc., Hamden, Conn., has acquired Applied Data Corp. of New Haven, Conn. Teletronics is a diversified electronics company supplying communications equipment and services to the commercial, industrial, and medical fields.

Staff Dynamics, Inc., a subsidiary of Data Products Corp., has acquired Opportunities, Inc., Stamford, Conn., a local personnel service. Staff Dynamics has acquired all assets of privately held Opportunities, Inc. in exchange for an undisclosed amount of cash.

Systems General Corp., Los Angeles, will acquire Dealers Exchange, Inc., Los Angeles, and Electromec Computing and Technical Services of Santa Clara, Calif. Dealers Exchange is an international information system for the exchange of new cars operating in 20 U.S. and Canadian cities. Electromec provides computer, technical, and graphic services.

General Research Corp., (GRC) Santa Barbara, Calif., has acquired American Technical Assistance Corp. (Atac). Terms of the acquisition were not revealed. However, the company indicated that GRC would issue common stock based upon a three-year earnings formula for all the outstanding stock of Atac. GRC is engaged in systems research and analysis, computer services and software, and the biological sciences for government and indus-

try. Atac, with offices in Washington and San Francisco, is engaged primarily in economic and management consulting, financial and resource allocation planning for community organizations, and the economics and design of nutrition programs.

Programming Sciences Corp. (PSC) of New York, a software development and systems programming firm, has agreed to acquire Administrative Systems, Inc. (ASI) Mineola, N.Y., a computer services firm, in exchange for common stock and warrants. The proposed acquisition is for about 148,000 PSC common shares in exchange for the outstanding shares of ASI. Additional PSC common would be reserved for issue and conversion of ASI convertible securities. Another term of the acquisition calls for PSC to deliver one common stock purchase warrant for each two PSC common shares exchanged for ASI common. The two-year warrants would be exercisable at varying prices after the closing of the acquisition.

University Computing Co., Dallas, a computer utility services firm, has agreed in principle to purchase the assets and business of the Systems and Services Division of Micromation Technology Corp., Chicago, for a total consideration of \$750,000. Systems and Services operates three COM service centers in Chicago, New York, and Arlington, Va.

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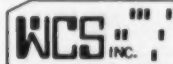
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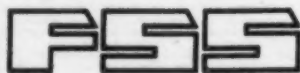
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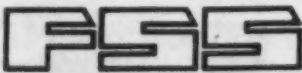
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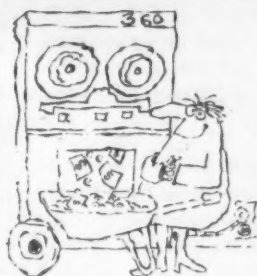


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## Charles Wang Named President of PDA

NEW YORK — Charles B. Wang has been named president of PDA Systems, Inc. Prior to his appointment, he was vice-president of operations for PDA. He brings to his new position broad experience in both conventional and interactive data processing using time-shared systems.

Formerly with Riverside Research and Columbia University's electronic research laboratories, he was involved with the creation of a computerized election districting and geographic information system for New York City. He was also responsible for designing a system to automate the processing of blood donor information as part of a National Blood Resources Management study.

### Telex Names P. Fellows Executive Vice-President

FAIRFIELD, N.J. — Philip W. Fellows has been appointed executive vice-president and general manager of Telex Corp. The company offers an automated reservation system serving the travel industry that was recently acquired by Wellington Computer Systems Inc.

Fellows joined Univac in 1964 and became manager, airlines

programs. At Univac, his marketing responsibilities included the installation of the BEA airline seat reservation system. Prior to that he was with Eastern Air

berg will be responsible for ASC research in aerosol techniques, air pollution, meteorology, ionospheric physics, and mathematical modeling.

■ R. William Grenie has been appointed vice-president, marketing, of Comma Corp., New York.

■ Spiras Systems, Inc., an affiliate of USM Corp., has appointed Richard A. Fredrickson as vice-president, marketing.

■ Fred David, director of product development, has been named vice-president of Automated Information Systems, Inc.

■ Robert D. Jacobs has been promoted to vice-president, marketing services, of University Computing Co.'s Computer Utility Network. David R. Maddox has also been appointed vice-president of operations of UCC's Applied Science Group.

## Executive Corner

Lines for 18 years where he became deputy vice-president, customer services.

### Other moves

■ Boothe Computer Corp., San Francisco, Calif., has appointed Charles Mickle vice-president. He will be working in the domestic and international areas of finance in Boothe's treasury department.

■ Dr. Ira Kohlberg has been elected vice-president, research, at Analytical Systems Corp. (ASC), Burlington, Mass. Kohl-

## User Update

Cities Service Oil Co. has appointed Jerry L. Hughey supervisor of material assets systems. Hughey will supervise the development of computerized procedures for areas associated with the physical properties of the company. Other promotions at Cities Service Oil Co. include: Harold D. Herbig, supervisor of seismic systems, and Ted K. Kramph, supervisor of exploration systems in the technical systems department of the Computing Division.

John B. Fried has been appointed chief of information systems research, and David M. Liston Jr. has been named fellow responsible for information research activity for the Columbus Laboratories of Battelle Memorial Institute.

The First National Bank of Dayton, Ohio, has named Albert Whitehead manager of data pro-

cessing and Howard E. Mutschler and Deane J. Winchell data processing officers.

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## Sanders Associates Returns to Profits in First Half

NASHUA, N.H. — Sanders Associates has become profitable again.

First-half figures for the period

ended Jan. 31 show a net income of \$265,000 or six cents a share, on sales of \$84.8 million.

The same period for fiscal

1969 showed a net loss of \$544,000 on slightly greater sales of \$84.9 million. That period was the first time Sanders

ever showed a loss, and it was due primarily to write-downs connected with a contract dispute with the Navy.

Sanders' business is primarily with the government, though the company has said it is seeking greater penetration of the commercial sectors.

Company President Royden Sanders Jr. predicted sales for the full year would total \$170 million to \$180 million, down from 1969's \$187.1 million. Sanders attributed the decline to "slow defense funding and a lack of programs in a severe defense environment."

Sanders predicted that second-half earnings would range between nothing and 50 cents a share. In fiscal 1969 the company earned 87 cents a share from operations, compared with this year's estimated maximum

of 56 cents. Last year, however, the Navy write-downs wiped out the earnings.

In November, Sanders had estimated 1970 earnings at 50 cents to a dollar a share, and sales at \$170 million to \$190 million.

Sanders has recently announced a new data entry terminal minicomputer system, the System 7000, which the company says will be used in regional telephone company offices for paper-work tasks.

Sanders also said that it had received an order from North Central Airlines for a reservation terminal system comprising 200 Sandac computers, CRT terminals, and hard copy machines.

At the company's last annual meeting the Sanders management said it had set a goal of achieving \$1 billion in commercial terminal sales by the mid-1970s.

## University Computing Sells Out \$40 Million Debenture Offering

NEW YORK — After two postponements, University Computing Co.'s (UCC) \$40 million public debenture offering has been sold out.

The securities sold at 101 with a 7-1/4% coupon, giving a 7.178% current yield and a 7.16% yield at maturity in 25 years.

The debentures are convertible into UCC common at the rate of \$46.50 of debenture for each share of stock. UCC was selling recently for \$44.75 a share. The offering had been delayed first to update the prospectus and then to include audited year-end figures in the offering circular.

The proceeds of the new financing will be used to finance UCC's recent acquisition of Computer Technology and its commitment to buy \$36 million of computer equipment from Univac, as well as reduce bank debt.

In a related development, UCC Chairman Sam Wyly denied any

knowledge of why UCC stock had plummeted in the past months.

At the beginning of 1970, UCC common was selling for over \$100 a share. It was recently traded in the mid-40s.

UCC said it plans to make its computer operations the "main thrust" of its business in the next decade. "Every company or product... University Computing evaluates will be doing things that complement the computer utility," a company spokesman said.

Company sources said that UCC considers the suits filed recently against its acquisition of 35% of Computer Technology to be "purely a nuisance thing."

The company also noted that the Gulf Insurance subsidiary had reduced its underwriting loss from \$4.8 million in 1968 to \$1.8 million in 1969, and that there is "no reason why the trend should not continue," and

that UCC expects Gulf to show an underwriting profit in 1970.

However, the sources pointed out that UCC considers Gulf primarily as a source of capital. According to the debenture prospectus, Gulf had an unrealized loss from revaluation of its portfolio of \$13 million. At the end of the year, though, the value of the securities in the portfolio was \$38.3 million more than their purchase price.

## Computer Technology Chief Parnell Predicts \$1.5 Million Loss for Quarter

DALLAS — Computer Technology Inc. (CT) expects a loss between \$1.2 million and \$2 million for the first quarter.

According to Douglass M. Parnell Jr., new president of CT, the loss will be due primarily to lower volume from regional sub-

sidaries without a corresponding reduction in overhead. Increased management fees and expenses and high fixed operating and executive costs are other factors in the profit squeeze, he said.

Parnell did not make any revenue projections.

CT recently reported final 1969 figures that showed net income of \$1,486,000, or 26 cents a share, on revenues of \$32,665,000. The earnings figure includes \$456,000 from Service Technology Corp. (STC), which has been sold to LTV Aerospace.

For the fourth quarter, CT revenues were \$10,261,000, of which \$9,140,000 was provided by STC, and earnings were \$154,000, all of which was supplied by STC.

CT's only previous report was for the five months from August, 1968, to Dec. 31, 1968. In that period the company made \$594,000 on sales of \$23,802,000.

Control of CT was recently transferred from LTV Aerospace to University Computing in a complex transaction.

Last month CT's former president, G. W. Woerner Jr., filed suit against UCC, LTV, and LTV Aero seeking \$87 million damages and charging that the defendants were unjustly enriching themselves at the expense of CT.

One of the charges Woerner made was that CT was forced to sign a \$200,000 a month management contract with UCC that CT didn't need and UCC couldn't perform.

## Com-Share Seeks New Money for Note After Failing March Profit Predictions

ANN ARBOR, Mich. — Com-Share, Inc. is having trouble paying its debts, too.

The company was not able to pay a \$500,000 debenture due Feb. 28, but the debenture holder has extended the due date to May 31 to allow the company to obtain new financing.

According to Com-Share President Robert F. Guise Jr., the company is now seeking additional financing either from the sale of stock or convertible debentures.

If the company cannot obtain the new financing it will not be able to pay the debenture or meet other current cash requirements, Guise said.

The company president also announced that a re-evaluation of operating results shows that the earlier prediction of company profits in March was wrong. Guise said that he expected Com-Share to become profitable by the end of 1970, provided the company could raise new working capital.

For the six months ended Dec.

31, Com-Share had operating losses of about \$1,754,000 as compared to \$1,177,000 for the same period in 1968, while revenue increased to \$2,147,000 from \$1,159,000.

Guise attributed the loss to a falling growth rate caused "basically by the economic crunch."

In February, Guise told financial analysts that Com-Share would be able to finance its future growth from its own earnings. The company has been profitless for four years.

## Xerox Confirms Time-Sharing Division; First Center to Open in Los Angeles

STANFORD, Conn. — Xerox Corp. has confirmed that it has entered the computer services business with the formation of a new company, Xerox Computer Services (XCS).

XCS will provide a time-sharing accounting service for small businesses. Its first facility will open in June in Los Angeles, where XCS is based, and additional centers will open in 1971.

James S. Campbell, former president and chief executive officer of Greyhound Computer Corp., will head the new company.

XCS plans to market accounting, billing, payroll inventory control, and similar packages to

small businesses and municipal governments.

CW had previously reported that Xerox Computer Services would be formed with the acquisition of Isaac-Dobbs Systems, a small Los Angeles software house which has been developing utility billing and accounting packages [CW, March 11].

The Xerox statement was unclear whether this acquisition will still take place. It did not mention Isaac-Dobbs.

Isaac-Dobbs had succeeded in selling its services to the city of Pasadena for a billing system against such stiff competition as Computer Sciences Corp. It had

been successful marketing its packages largely through banks.

Dan L. McGurk, Xerox group vice-president who will be responsible for XCS, noted that "this type of current management information has never been available to small businesses which often could not employ skilled data processing personnel or install their own computers."

McGurk said that "formation of this new company expands the capabilities of Xerox in computer technology."

Xerox has been in the computer industry since last May when it acquired Scientific Data Systems of El Segundo, Calif.

## Bonanza Hotel Casino Closed In Levin-Townsend Retrenchment

NEW YORK — Levin-Townsend Computer Corp. (L-T) has closed the gambling casino of its Bonanza Hotel in Las Vegas. The Bonanza is one of a number of acquisitions the company made in the past two years.

The hotel will continue renting rooms to guests, but will discontinue food service, L-T announced. L-T had previously stated that it planned to withdraw from unprofitable diversifications and concentrate on its computer leasing and real estate business.

The Bonanza is one of the acquisitions that led the L-T board to fire Howard S. Levin as chairman of the company.

The company is negotiating the sale of the Bonanza to a group of Canadian investors.

Levin has sued to be reinstated as chief officer of the company he founded along with James E. Townsend, current chairman. Levin charged that his removal was illegal and the result of a conspiracy of the L-T board of

directors.

Townsend counter-charged that Levin ran the company autocratically and squandered company funds in the face of a severe cash balance crisis.

LT is currently seeking new financing to meet an \$11.2 million obligation to IBM that was due March 17.

The company's nine-month report showed a net loss of \$15,872,000 after inclusion of write offs of \$19,519,000.

## CPC Reports Net

NEW YORK — Computer Property Corp., which markets computers, systems, and services, has turned in net income for the year ended Dec. 31, 1969 of \$513,681, a gain of 140% above the 1968 net income of \$213,770.

The 1969 earnings equalled 76 cents per share, compared with 56 cents per share for 1968.

Revenues for 1969 were \$3,666,848.



## Pastures of Plenty?

# Just How High Will Viatron's Profit Margins Be?

By Michael Merritt  
CW Staff Writer

BEDFORD, Mass. — Ever since the announcement, Viatron's System 21 has been surrounded by a thick fog of disbelief, claims, counter-claims, projections, dejections, and rejections. And all to often, not much sense.

But there are some real facts, and an interesting story.

Except for the MOS chips, the System 21 is about as complicated as a color TV set, and in volume production its cost should be in the same ballpark as a color TV set. The graphic display is a commercial portable TV, less its front end, bought in quantity, made in Japan. The tape drive is two potted motors bolted onto a bracket. The keyboard uses phototransistors breaking lightbeams rather than mechanical linkages. In its own way it is an elegant design, simple, reliable, and above all, cheap.

LSI/MOS (Large Scale Integrated Metal Oxide Semiconductors) is the other means of paring expenses. By using this fairly difficult technique, Viatron can compress large numbers of circuits into one small component, an MOS chip. The simplest System 21 configuration uses 43 of these chips.

If one guesses at an average cost of \$10 per chip — which in orders of tens of thousands is certainly high — the MOS costs of the cheapest System 21 still come in under \$450.

In fully automated production, Viatron has said MOS chips should account for 60% of the cost of the unit. This means that the minimum unit could cost under \$1,000 while selling for \$1,872. If the chips average \$20

each, the 60% figure would give a unit cost of about \$1,400, or a profit margin of nearly 25%.

Dr. Edward Bennett, Viatron president, told financial analysts recently that right now production costs were "substantially" below price. There is no reason to doubt Bennett since the chip problem seems to be in hand and the unit itself is simply cheap to build. When Viatron moves to its new facilities and goes into fully automated production, and MOS costs fall, there is no reason it shouldn't be able to enjoy a profit of 50%.

### Pic in the Sky?

The average ordered unit runs about \$3,750. Viatron, of course, will not release figures on its order backlog, but estimating 50,000 units and a 50% profit margin, and doing a little multiplying, one comes up with the interesting figure of \$93.75 million for gross manufacturing profit.

It sounds suspiciously like pastures of plenty and pie in the sky, but it also indicates the market Viatron has discovered and the money it could make.

First of all, sales orders of 50,000 are not unreasonable by any means; the total market for cheap terminals easily runs into the hundreds of thousands. The margin figure of 50% can be met, either by Viatron or somebody else, because the units are not sophisticated devices made by hand, but simple, TV-like devices made on a mass production line.

The next question is whether Viatron can make 50,000 terminals. Its current facilities just started producing 600 terminals a month. In January the figure

was 400. By mid-1970 it says it will be producing 1,000 per month. Viatron's production predictions have been, well, optimistic in the past; it had said it would be making 5,000-6,000 terminals a month by mid-1970.

The company's production facilities are now about as crowded as they can get. In the next few weeks, Viatron will move to new quarters of about 158,000 sq ft, four times what it has now. It will also be increasing the mechanization of its production line. Though there is some question of how much disruption will be caused by the move, production of over 1,000 unit/mo by the end of summer seems certain.

### Grab the Goodies

And even 1,000 terminals mean a dollar volume of \$3,750,000/mo, and a 25% margin would yield about \$950,000/mo in profit, or \$11 million/yr.

Viatron's contractual obligations to semiconductor suppliers also indicates the size of its plans. So far, the company has announced \$63 million of orders for MOS and other discrete devices for the coming 18 months, and \$15 million more may be announced soon. If one assumes that these costs represent 50% of the manufacturing costs, and that there is a 100% markup, the total dollar volume for the next 18 months to two years will be around \$300 million, with a gross manufacturing profit of \$150 million.

Viatron has discovered a sweet, shining, gaping hole in the computer market structure, and it has been running to get through it and grab the goodies before

the rest of the world realizes what's going on. It's been a chore, since the company started with nothing, and its potential big-league competition — Sanders or Raytheon, for example — could doubtless have swamped Viatron if they had been quick on their feet.

So part of the razzle-dazzle projections from Viatron, the flashy, expensive advertising, the trumpets and cannons and rockets has been a piece of Viatron marketing and psychological genius. The bomb of announcing the System 21 as accomplished fact, soon to be available in staggering quantities, and at impossible, unheard-of prices, was literally numbing. The feeling was that some wizards from Mitre, through the alchemy of metal oxide semiconductors, had passed a technological miracle and were somehow offering to turn base metal to gold.

And it was a lot easier to sit back and watch Viatron fail than to see how unmiraculous it all really was.

In the beginning Viatron took a big risk. To sell at its price, it had to mass produce, which means very high startup costs for low production costs. To do this, it had to sell in volume, tens of thousands of units. To find this market, the price had to be startlingly low.

Even more, Viatron needed lots of capital. Tooling up to produce anything in high volume — even toothpicks — is not cheap, and last year alone Viatron spent over \$9 million without a cent of return. And there was the need to claim part of the

market before competition developed.

The razzle-dazzle facilitated all this. It attracted capital. It awoke a market. It stunned competition.

Thanks to the P.T. Barnum advertising, Viatron has snapped up an order backlog of several hundred million dollars; it's gotten \$36 million of financing, developed a marketing organization, and has built a production facility that can turn out 600 units a month.

Most important, though, it has gotten its terminals into the hands of users long before its competitors. Sanders Associates recently announced that it has under development a "desk-top display terminal" that sounds very much like the System 21 and that it was to be "inexpensive enough to open such broad markets as small businesses," which certainly sounds like Viatron's price structure. But Viatron now dominates its segment of the market by right of exclusivity; it sets prices, and it can finally say of its competitors, "show me one of their terminals."

There will certainly be competition. For one thing, the market potential is so great — conceivably millions of units — that Viatron will never capture it all. And once larger companies see the profit potential Viatron has found, they will be able to use financial and technical resources much greater than Viatron's. But despite all the oversize projections, and all the prophecies of doom, Viatron, which two years ago wasn't anything, is now in the middle, fighting.

## Earnings Reports

### COMRESS INC.

Year Ended Dec. 31

	1969	1968
Shr Ernd	\$ .08	\$ .04
Revenue	4,979,000	3,213,000
Earnings	536,000	236,000

### LECTRO COMPUTER LEASING

Year Ended Dec. 31

	1969	1968
Shr Ernd	\$ .48	\$ .15
Revenue	950,500	329,400
Earnings	171,700	46,900

### COMPUTER PROPERTY CORP.

Year Ended Dec. 31

	1969	a1968
Shr Ernd	\$ .76	\$ .56
Revenue	3,666,848	2,602,357
Earnings	513,681	213,670
3 Mo Shr	.22	.14
Revenue	1,021,848	722,357
Earnings	149,681	52,670

a-Restated to reflect acquisition of List Management Inc., in 1969 on a pooling-of-interests basis.

### TALLY CORP.

Year Ended Dec. 31

	1969	1968
Revenue	\$10,977,252	\$10,391,719
Spec Chg	a185,080	.....
Loss	1,822,970	2,572,204
3 Mo Shr	.....	.....
Revenue	3,711,279	3,190,203
Spec Chg	a30,500	.....
Loss	79,884	2,718,876

a-Cost of relocation to new plant facilities.

### FOXBORO CO.

Year Ended Dec. 31

	1969	1968
Shr Ernd	\$1.05	\$ .58
Revenue	119,625,000	113,374,000
Earnings	4,424,000	2,459,000
3 Mo Shr	.36	.12
Revenue	32,134,000	27,392,000
Earnings	1,491,000	497,000

### GRAPHIC SCIENCES INC.

Three Months Ended Dec. 31

	1969	1968
Revenue	\$1,511,696	\$681,509
Earnings	1,234,959	a18,420
6 Mo Shr	.....	.....
Revenue	3,037,226	1,183,388
Earnings	2,665,278	a34,499

a-Income. The company states that, due to the commencement of revenue-producing operations of the graphic communications systems activity of Jan. 1, 1969, the consolidated operating results of the company for the quarter and six months ended Dec. 31, 1968, are not comparable with those for the quarter and six months ended Dec. 31, 1969, and that since the company had not begun revenue-producing operations as at Dec. 31, 1968 with respect to graphic communications systems, expenses directly related to this activity have been deferred. The aggregate amount of such costs, which were incurred and changed to deferred expenses in the quarter and six months ended Dec. 31, 1968, was \$382,652 and \$738,684, respectively.

### STERLING COMPUTER SYSTEMS INC.

Nine Months Ended Jan. 31

	1970	1969
Shr Ernd	a\$.19	\$.14
Revenue	2,356,594	1,672,593
Earnings	445,126	338,465

a-Prior to extraordinary loss of \$18,400, equal to one cent a share.

### COMPUTER RESOURCES

Three Months Ended Dec. 31

	1969	1968
Shr Ernd	\$ .10	\$ .07
Revenue	359,203	160,506
Earnings	39,493	27,799

This report is unaudited.

### HATHAWAY INSTRUMENTS INC.

Six Months Ended Dec. 31

	1969	1968
Shr Ernd	\$ .20	\$ .24
Revenue	2,469,235	2,425,620
Earnings	160,153	171,099

### AUTOMATED MARKETING SYSTEMS, INC.

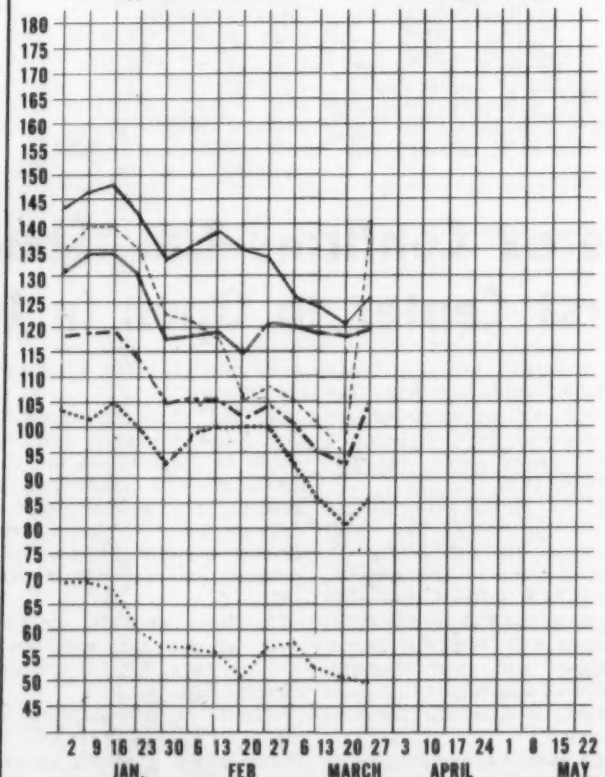
Year Ended Dec. 31

	1969	a1968
Shr Ernd	b\$1.00	\$ .45
Revenue	7,779,670	6,367,923
Spec Cred	68,000	.....
Earnings	587,829	234,535

a-Restated to include operating results of companies acquired on a pooling-of-interest basis; b-Includes 12 cents from subsidiary tax loss carryover.

## Computer Stocks Trading Index

— Computer Systems      - - - - Software & EDP Services  
- - - - Peripherals & Subsystems      - - - - Leasing Companies  
— Supplies & Accessories      - - - - CW Composite Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68



# Computerworld Stock Trading Summary

CLOSING PRICES, MARCH 26.

All starred (\*) stock closings represent March 19, since current closings were not available due to Post Office and Air Controller strikes.

## SUPPLIES &amp; ACCESSORIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O	46-35	46	ACME VISIBLE	+ 1 1/2	+ 3.37
N	15-11	12 3/8	ADA'S-MILLIS CORP	+ 1/4	+ 2.06
O	21-16	16 1/2*	BALTIMORE BUS FORM	---	---
A	25-12	13 5/8	BARRY WRIGHT	+ 5/8	+ 4.81
A	35-28	29 1/4	DATA DOCUMENTS	+ 1/8	+ 0.43
N	19-14	15 3/8	ENNIS BUS. FORMS	---	---
N	166-106	117 1/2	MEMOREX	- 2 1/8	- 1.78
N	114-99	103 3/8	3M COMPANY	+ 1 3/8	+ 1.35
O	38-34	37 3/8	MOORE BUS FORMS	+ 1/2	+ 1.36
N	43-35	37	NASHUA CORP.	+ 7/8	+ 2.42
O	48-42	45	REYNOLDS & REYNOLD	+ 1/4	+ 0.56
O	30-26	29 1/4	STANDARD REGISTER	---	---
N	39-8	37 3/4	JARCO	+ 5/8	+ 1.68
A	30-15	19 1/2	WABASH MAGNETICS	+ 3	+ 13.18
O	41-36	40	WALLACE BUS FORMS	+ 3/4	+ 1.91

## COMPUTER SYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
N	172-129	147	BURROUGHS CORP	+11 1/2	+ 8.49
N	37-20	25 1/8	COLLINS RADIO	+ 1/4	+ 1.01
N	122-56	57 1/4	CONTROL DATA CORP	- 5 1/2	- 8.76
A	124-91	102 5/8	DIGITAL EQUIPMENT	+ 4 7/8	+ 4.99
N	11-7	8 1/4	ELECTRONIC ASSOC.	+ 1/8	+ 1.54
A	14-9	9 1/2	ELECTRONIC ENGINEER.	---	---
N	39-30	39	FOXBORO	+ 2 1/4	+ 6.12
O	42-24	25	GENERAL AUTOMATION	- 1/2	- 1.96
N	98-67	74 1/8	GENERAL ELECTRIC	+ 4 1/4	+ 6.08
N	110-43	44 3/4	HEWLETT-PACKARD CO	- 1/2	- 1.10
N	152-121	128	HONEYWELL INC	+ 5 3/8	+ 4.38
N	387-315	333 1/4	IBM	+13 1/2	+ 4.22
N	171-129	140 1/2	NCR	+ 9 3/8	+ 7.15
N	34-29	30 7/8	RCA	+ 3/8	+ 1.23
N	33-26	28 7/8	RAYTHEON CO	+ 2 1/8	+ 7.94
O	8-2	5 3/4	SCI. CONTROL CORP.	+ 1 3/4	+ 43.75
N	40-33	38	SPERRY RAND	+ 1 7/8	+ 5.10
A	49-33	37 1/4	SYSTEMS ENG. LABS	+ 2 5/8	+ 7.58
N	29-22	24 7/8	VARIAN ASSOCIATES	+ 1/2	+ 2.05
A	51-36	43 1/4	WANG LABS.	+ 5 1/8	+ 13.44
N	115-88	94	XEROX CORP	+ 3 5/8	+ 4.01

## LEASING COMPANIES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O	9-6	7 3/4	BANISTER CONTIN	- 1 1/4	- 13.99
O	25-20	23 1/2	BOOTH COMPUTER	+ 1 1/2	+ 6.82
O	8-7	7 7/8	BRESNAHAN COMP.	- 1/8	- 1.56
O	8-6	6 1/2	COMPUTER EXCHANGE	---	---
O	18-9	9	COMPUTER LEASING	---	---
O	15-8	8 1/2	CYBER-TRONICS	- 1 1/2	- 15.00
N	32-19	21 3/8	DATA PROC. F & G	+ 1 1/4	+ 6.21
O	8-4	6 1/4	DATRONIC RENTAL	+ 1 1/4	+ 25.00
A	24-18	20 3/4	DEARBORN COMPUTER	+ 1 5/8	+ 8.50
O	8-6	8 1/4	DIEROLD COMP. LEAS.	+ 1 3/8	+ 20.00
A	10-6	7 1/4	DPA, INC.	+ 5/8	+ 9.43
A	22-14	17 1/4	GRANITE MGT	+ 1 3/8	+ 8.66
A	14-11	12 1/2	GREYHOUND COMPUTER	+ 1 3/8	+ 12.36
N	30-16	19	LEASCO DATA PROC.	+ 7/8	+ 4.83
O	5-4	5 1/2	LECTRO COMP LEAS	+ 1/8	+ 2.33
A	19-8	9 1/4	LEVIN-TOWNSEND CMP	---	---
O	4-2	2 5/8	MANAGEMENT ASSIST	+ 1/4	+ 10.53
O	8-6	7 7/8	NCC LEASING	- 1/8	- 1.56
O	8-5	5 1/2	SYSTEM CAPITAL	- 1/4	- 4.35
A	19-13	18 5/8	U.S. LEASING	+ 7/8	+ 4.93

## PERIPHERALS &amp; SUBSYSTEMS

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
N	62-42	46 7/8	ADDRESSOGRAPH-MULT	+ 2 1/2	+ 5.63
O	15-7	7 5/8	ALPHANUMERIC	- 2 1/4	- 22.78
N	48-33	37 1/4	AMPEX CORP	+ 2 1/8	+ 6.05
O	18-9	9 3/4*	APPLIED LOGIC	---	---
A	34-8	9 7/8	ASTRODATA	+ 7/8	+ 9.72
O	11-8	9	BOLT, BERANEK & NEW	- 3/4	- 7.69
N	14-11	13 1/8	BUNKER-RAND	+ 3/8	+ 2.94
A	33-23	28	CALCOMP	+ 2 1/4	+ 8.74
O	13-8	9 1/2	COGNITRONICS	+ 1/2	+ 5.56
O	12-8	10 1/4*	COLORADO INST.	---	---
O	36-27	29	COMPUTER COMMUN.	---	---
A	12-7	7 7/8	COMPUTER EQUIPMENT	+ 1/2	+ 6.78
A	27-20	24 7/8	COMPUTEST	+ 1 1/2	+ 6.42
A	25-17	19 3/4	DATA PRODUCTS CORP	+ 1 1/2	+ 8.22
O	23-16	19 1/2	DATA TECHNOLOGY	+ 1	+ 5.41
O	13-8	8 1/2	DIGITRONICS	+ 1/2	+ 6.25
N	40-21	25 5/8	ELECTRONIC M & M	+ 1 3/4	+ 7.33
O	8-5	6	FABRI-TEK	+ 1/4	+ 4.35
O	17-9	10 3/4	FARLINGTON MFG	+ 1 1/4	+ 13.16
O	7-4	6 1/4	GRAHAM MFG.	- 1/8	- 1.96
O	20-14	16	INFORMATION DIS	+ 2	+ 14.29
A	67-33	40 3/8	MARSHALL INDUSTRIES	+ 5 5/8	+ 16.19
A	84-58	73 1/2	MILGO ELECTRONICS	+14 1/2	+ 24.58
N	87-55	60 3/4	MOHAWK DATA SCI.	+ 4 1/2	+ 8.00
O	52-24	27	OPTICAL SCANNING	- 2	- 6.90
O	17-10	11 3/8	PHOTON	+ 1 3/8	+ 13.75
O	4-2	2 3/4	PHOTO-MAGNETIC SYS.	- 1/4	- 8.33
A	42-27	40 1/8	POTTER INSTRUMENT	+ 4 7/8	+ 13.83
O	25-15	19 3/4	PRECISION INST.	+ 3/4	+ 3.95
O	83-45	48	RECOGNITION EQUIP	- 2 1/2	- 4.95
O	34-25	28 3/4	REDCOR CORP.	+ 3/4	+ 2.68
N	29-15	17	SANDERS ASSOCIATES	+ 1	+ 6.25
O	53-25	26	SCAN DATA	---	---
O	23-17	19 1/2	TALLY CORP.	+ 1/4	+ 1.30
N	159-90	128 1/2	TELEX	+11 3/4	+ 10.06
O	50-27	33	VIATRON	+ 2 3/4	+ 9.09

## SOFTWARE &amp; EDP SERVICES

EXCH	1970 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O	6-4	4 1/2	ADVANCED COMP TECH	- 1	- 18.18
A	24-7	8 1/2	APPLIED DATA RES.	+ 1/2	+ 6.25
O	8-3	3 1/2	ARIES	+ 1/2	+ 16.67
A	47-35	40 5/8	AUTOMATIC DATA PROC	+ 3 1/3	+ 8.33
O	14-8	9 1/4	AUTO SCIENCES	+ 1	+ 12.12
O	9-4	5	BRANDON APPL SYS	---	---
O	3-1	2 3/8*	COMPUTER AGE INDUS.	---	---
A	12-6	8 1/8	COMPUTER APPL	+ 3/8	+ 4.84
O	14-8	10	COMPUTER ENVIRON	---	---
NAT	5-3	4 1/8*	COMPUTER INDUS.	---	---
O	13-8	9	COMPUTER NETWORK	---	---
O	15-12	13 3/4	COMP. PROPERTY	- 1/4	- 1.79
N	34-20	22 3/8	COMPUTER SCIENCES	+ 1 3/4	+ 8.48
O	8-5	6 1/4	COMPUTER USAGE	- 1/4	- 3.85
A	75-50	56	COMPUTING & SOFT	+ 1 7/8	+ 3.46
O	9-6	7	COMRESS	---	---
O	14-5	5	COMSHARE	---	---
O	3-1	1 3/4*	CONSOL. ANAL. CENT.	---	---
O	24-15	15	DATA AUTOMATION	- 1 1/2	- 9.09
O	28-18	19	DATA PACKAGING	- 1 3/4	- 8.43
O	6-3	3 3/4	DATAMATION SERVICE	- 1/2	- 11.76
O	8-5	8	DATATAB	+ 1/2	+ 6.67
O	4-2	3 1/2*	DIGITEK	---	---
O	13-9	11 1/4	EDP RESOURCES	- 1/4	- 2.17
A	11-8	9 1/8	ELECT COMP PROG	+ 1	+ 12.31
O	161-144	159	ELECTRONIC DATA SYS.	- 2	- 1.24
O	20-13	13 3/4	INFORMATICS	- 3/4	- 5.17
A	25-12	16 1/2	ITEL	+ 2 3/8	+ 16.81
O	7-3	3 1/4	LEVIN-TOWNSEND SERV.	+ 3/4	+ 18.75
A	25-18	21	MANAGEMENT DATA	+ 1 1/2	+ 7.69
O	3-5	5 3/4	NAT COMP ANALYSTS	- 1/2	- 8.00
O	10-3	10 1/2	NAT. COMP. SERV.	+ 3 3/4	+ 55.56
N	53-36	40	PLANNING RESEARCH	+ 1	+ 2.50
O	27-17	19	PROGRAMMING METHODS	+ 2	+ 11.76
O	5-3	4	PROGRAMMING & SYS	---	---
O	33-17	17 1/2	PROGRAMMING SCIENCES	- 1/2	- 2.94
N	14-6	8 1/8	SCIENTIFIC RESOURCES	+ 1/4	+ 3.17
O	2-1	1 7/8*	SOFTWARE SYSTEMS	---	---
O	3-2	2 1/8	STRATEGIC SYS	- 3/8	- 15.00
O	27-15	17	TBS COMP CENT INC.	+ 1	+ 6.25
O	4-3	4 1/4	UNITED DATA CENTER	+ 1/4	+ 6.25
N	99-41	43 1/2	UNIVERSITY COMP.	- 1/8	- 0.29
A	20-16	17	URS SYSTEMS	- 1/8	- 0.73
O	13-7	10 3/4	U.S. TIME-SHARING	+ 1/2	+ 4.88

## Nickels and Dimes

Revenues up 40% and net up 97% at **INFORMATION DISPLAYS**, graphic terminal maker. Total sales were \$2,516,809 for the year, and net income hit \$176,721, or 27 cents a share. The company has recently opened branches in Britain and France.

\$\$\$

Nine-month revenues of **DIGITRONICS** totaled \$13.2 million, up from last year's \$11.9 million. Earnings were down to eight cents a share from last year's 15 cents, exclusive of tax-loss carryforwards. Total earnings were \$748,000 for last year's nine months and \$440,000 for this year.

\$\$\$

**URS SYSTEMS** is asking its shareholders to increase the number of authorized common shares from three million to five million, and lower the number of directors from 11 to seven-to-nine. Though URS's proxy material said only that the additional shares were for "future requirements," acquisitions seem the likely purpose.

\$\$\$

Even sales marked the first quarter at **COMPUTER APPLICATIONS**, but only an extraordinary item of \$3.3 million saved the company from reporting a doubled net loss. Including the proceeds from the sale of 18% of E.B.S. Data Processing, Computer Applications reported a net profit of \$1,093,000 for the quarter, or 68 cents a share. Last year it lost \$677,000 or 43 cents a share. However, the operating loss was \$2,189,000, or \$1.36 a share. Speedata Inc. accounted for \$1,829,000 of the operating loss. Sales for the quarter were \$10,152,000.

\$\$\$

**DATA ARCHITECTS** has banded with XDS to offer **DAI-SECURE**, a high-powered brokerage back office management system. The system comes in a time-shared flavor for small customers, as well as a stand-alone version for bigger houses. The system uses a Sigma 7 with switching by Sigma 3s. Total capital for the venture is projected at \$9.5 million.

\$\$\$

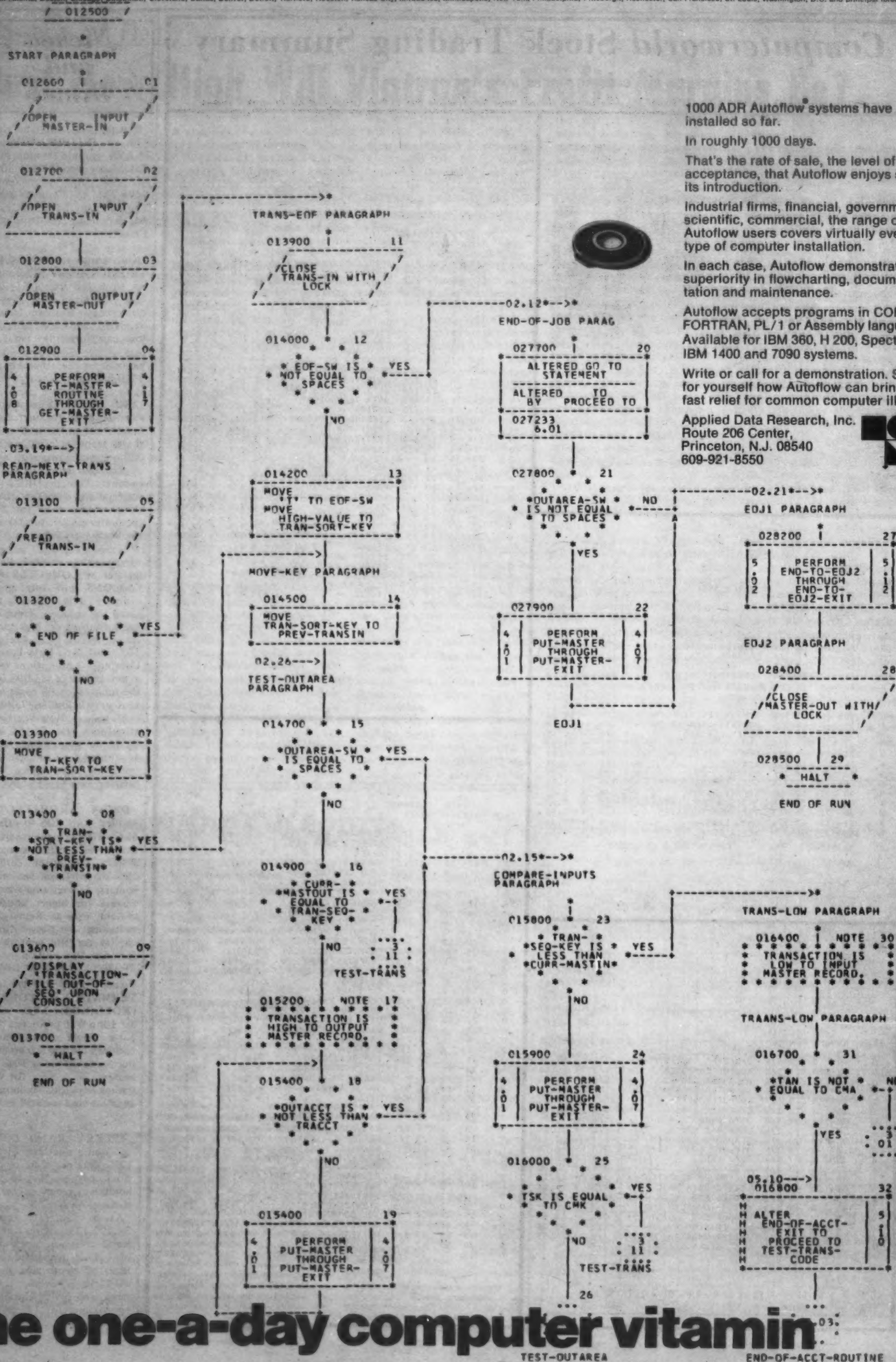
And from across the sea, **INTERNATIONAL COMPUTERS (HOLDINGS) LTD.** chairman Sir John Wall predicted the company would show "improved" earnings for the six months ending April 8, and a 10% to 20% increase in volume for the year ending Sept. 30. Six-month earnings last year were \$4 million.

\$\$\$

**SPERRY RAND CORP.** has declared a quarterly dividend of 12 1/2 cents per share of common stock, payable May 18, to stockholders of record at the close of business on April 3.

As of Jan. 31, there were 34,195,129 shares of Sperry Rand common stock outstanding. The diversified manufacturer of electronics, hydraulics, electric shavers, computers, farm, and office equipment has approximately 132,547 shareholders.





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